Joint Logistics Commanders Guide for
The Management of Joint Service Programs

A Handbook for Managers Entering the World of Multiservice Systems Acquisition

The Defense Systems Management College Fort Belvoir, Virginia June 1982

AN UPDATE OF

Joint Logistics Commanders' Guide for the

MANAGEMENT OF JOINT SERVICE PROGRAMS

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THE DEFENSE SYSTEMS MANAGEMENT COLLEGE
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PREFACE

This is the first update of *Guide for the Management of Joint Service Programs*. The update is based on comments and inputs from Joint Program Offices, Service Logistics Commands and System Commands.

This Guide was prepared under the sponsorship of the Joint Logistics Commanders (JLC). Its goal is to provide newly assigned managers of joint programs the benefit of some of the hard earned lessons learned by previous managers who have held such position. The Guide is limited to U.S. Multi-Service programs. The Guide also describes the nature of joint programs, how they differ from single-service programs, which aspects of program management demand greater emphasis than normally accorded single-Service Programs, and some of the pitfalls of joint program management. It is assumed throughout the Guide that the reader is trained or experienced in military program management. Thus there is no attempt to teach program management. The Guide simply offers advice in hope that the newcomers will more quickly acclimate to the joint program environment and avoid early mistakes that could make their job more difficult.

The material for this Guide comes from a variety of sources identified in the footnotes and references and from experience related by joint service program managers and their staffs. The major changes to this guide include discussion DEP SEC DEF initiatives regarding the acquisition process, revision of Chapter 4 on acquisition strategy, addition of cost terms to the Financial Management Chapter, providing a common thread of an acquisition strategy and charter for the Advanced Tactical Aircraft Protection Systems (ATAPS), instructions for the preparation of Joint Integrated Logistics Support Plans (JILSP), Definition of terms and a list of Joint Service Programs. The drafting or update of the chapters was accomplished by Colonel John Patterson, USATCOMA; Mr. Ivan Taylor, Mr. Bob Foley, AFLC; Mr. L. P. Timmeney, NAVMAT; Mr. Hal Barton, AFSC; John Fargher, Lieutenant Commander Ed Wicklander, DSMC.

Aside from its usefulness to program managers of joint programs, this Guide should be of interest to help to the many other personnel involved in the single-Service and international programs. It must be recognized that the material presented in this Guide is subject to change or adaptation as circumstances require and experience demands. It is planned to issue revised editions of the Guide periodically. However, program managers and other users of this Guide must rely on official documentation for detailed decision-making and administration.[1]

1. Shortly before the Joint Commander signed this guide, the Deputy Secretary of Defense, Frank C. Carlucci signed DOD Directive 5000.1 on 29 March 1982. Also, on 12 April 1982, the Under Secretary of Defense, Research and Engineering, Richard D. DeLauer, promulgated by memorandum major defense system acquisition program documentation format. Because of the close proximity of these events, the policy and requirements of these documents may not be fully included in this guide. Accordingly, the reader should seek additional guidance from these source documents.

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CHAPTER I
Introduction

Why Are You Reading This Guide?

Chances are that you anticipate assignment to, or have arrived in, a new job which has joint service acquisition responsibility.

If so, you have probably researched the Department of Defense Directives System Quarterly Index[1] and the Defense Acquisition Regulatory System Index for leads to guidance on the management of joint or multi-service system acquisition programs. Alas, that search has been futile. So this document, *Guide for the Management of Joint Service Programs,* seems to be the very target of your search.

If the guidance you seek is to reduce all joint program management concerns to textbook solutions, you will be disappointed. If you seek a "Joint PERT"[2] which will lay out the critical path from statement of a joint requirement to deployment of a short range, air-to-air "purple widget,"[3] you will likewise be disappointed. The guide will not introduce any new tools custom-designed for the multi-service system acquisition environment. It will not reduce the problems of joint program management to a mechanical level of accomplishment. It is not a primer on project management. (If refreshment in the basics of program management is required, a review of "Introduction to Military Program Management"[4] is recommended.)

The guide does put some of the common program management problems in a joint service framework. It presents some of the problems—and some possible solutions—which are unique to joint program management. It discusses some service-peculiar approaches to certain aspects of acquisition management to help members of a joint program management team understand what their colleagues from other services are talking about. It highlights areas in which joint programs require greater attention than, or a different approach from, single-service programs, alerts the joint program manager to major differences between the services, and passes on some lessons learned by previous joint program managers. Most important, it will assure the new joint program manager that he is not the first to experience the joint program environment, and that by learning from his predecessors he can avoid many joint program problems.

Intent of the Guide

The Guide presents the paramount concerns of a joint program manager in a logical sequence. Some of the earlier topics may be part of a program's history by the time a program has been initiated and a program manager assigned. Nevertheless, they are the foundation of a joint program, and their treatment is intended to assist in the establishment as well as in the management of a joint program. Although the chapter sequence is logical, the sequence does not imply that attention to the subjects of later chapters, logistics and test and evaluation, can be postponed to late in the program.

All the aspects of acquisition management in a joint service environment can not be attacked by the program manager all the time with all of his attention. This guide will have been successful if the joint program manager gains an appreciation of the variety of challenges awaiting him, the diversity of methods to meet those challenges, and the areas where his attention and innovation will be most effective.

Other Documents on Joint Program Management

In 1973, the Joint Logistics Commanders signed a memorandum of agreement which was subsequently promulgated as a joint regulation.[5] (A copy of the agreement is in Appendix A.) That document, conceived almost a decade ago, sets forth principles of joint program management that continue to provide a solid foundation to the establishment of a joint program management office. It introduces the concept of the Executive (sometimes referred to as Lead) and the participating services, and establishes general responsibilities and authorities of both. It provides for use of Executive Service program management procedures in areas where common procedures do not exist, and calls for Multi-Service Program Charters, Program Master Plans, and Joint Operating Procedures to be prepared as documentary instruments of joint program management. Use of this regulation at the inception of a joint program, or at the marriage of ongoing single-service programs, will provide a "leg-up" to the people responsible for initiating the joint effort.

The Variety of Joint Programs

Joint programs display a wide range of diversity in their structures, sizes, and objectives. Consider the joint program types depicted in Figure 1-1 and described in Table 1-3. Forming the lower half of the circle in Figure 1-1 are programs in which there exists but a single program office. These start with S-1, a single-service program without joint interest or participation, and progress counterclockwise through various organizations exhibiting increasing interest and participation by another service to S-6, which is a fully integrated joint program office. On the top half of the circle are depicted various types of programs in which there are multiple program offices, usually at least one in each of the participating services. These, starting with M-1 and still moving counterclockwise, continue the progression of increasing individual service interest and participation in the program, but at the same time depict a general decrease in the commonality of the individual service efforts. At M-5, the progression has gone full circle; the services are conducting fully independent programs.

The scheme used in Figure 1-1 to illustrate the diversity of joint programs is unimportant in itself. Any given program might not fit exactly into one of the categories. Indeed, some programs tend to migrate from one category to another during the life of the acquisition program, for example from M-5 during advanced development to M-1 during engineering development to S-2 during production. What is important is to understand that joint programs are well dispersed among the categories (excluding S-1 and M-5 which are not "joint"). On the one hand, this diversity sets free a new joint program from the constraints of precedents. A joint program can be structured any way necessary to accomplish the program's goals. On the other hand, the base of experience for each type of joint program is small, and the advice and direction a new joint program manager receives (including that provided in this guide) might have been formed from a joint program environment not at all similar to his own.

Certainly the size, that is, the cost, of a program, its importance, its urgency, and other factors which influence its visibility, will affect a joint program and its way of doing business. A joint mobile electric power (portable generator) program, for instance, will look different than a joint cruise missile program. The manager of each program will be influenced by different precepts even though both may be classified as "joint programs."

Most available policy and procedural guidance on joint program management has been developed by cooperative work among service organizations and published as joint service documents, rather than from the Office of the Secretary of Defense (OSD). With the significant exception of the joint regulation discussed above, these documents generally treat a specific area of joint program management in detail. Most of these joint service regulations and agreements are discussed in the following chapters as appropriate to their subject matter, e.g., the Standard Integrated Support Management System (SISMS) joint regulation is discussed in Chapter 9, "Logistics." A list of joint service documents which specify common approaches to program management practices is provided in Table 1-1.

Individual service program management guides or handbooks, which might be especially helpful to non-Executive Service members of a joint program management team, are listed in Table 1-2.

A major aspect of program management is the establishment and administration of contracts. The service-wide source of contracting guidance is the Defense Acquisition Regulatory System (DARS). The DARS is discussed in Chapter 4, "Acquisition Strategy," of this guide.

Footnotes

1. Department of Defense Directive 5025.1-I.
2. PERT - Program Evaluation Review Technique.
3. Purple Widget - A cooperative effort among services is often referred to as "purple," as in "purple-suited"—referring to the apparent color of a uniform, whether it is actually light or dark blue or green. "Widget" is simply a familiar term used to denote any piece of equipment or implement, a modern adaptation of "thingamajig."
4. Defense Systems Management College, "Introduction to Military Program Management," 1969 (rev. 1978), prepared by Logistics Management Institute, 4701 Sangamore Road, Washington, D.C. 20016.
5. Previously DOD Directive 5000.1 did not address Joint Service Program Management. This void necessitated the Joint Logistics Commanders memorandum of agreement which was subsequently promulgated as a joint regulation (Joint Air Force Systems Command/Air Force Logistics Command/Army Materiel Command/Naval Material Command Regulation, "Management of Multi-Service Systems/Projects/Programs," AFSC/AFLC R 800-2, AMC R 70-59/NAVMATINST 5000.10A). The 29 March 1982 issue of DOD Directive 5000.1 on Major Systems Acquisition does include policy direction on Joint/Multi-Service Program Management. Because of this, the Service regulations cited above are being reviewed for possible cancellation, but procedural guidance is included herein.

Figure 1-1
TYPES OF JOINT PROGRAMS

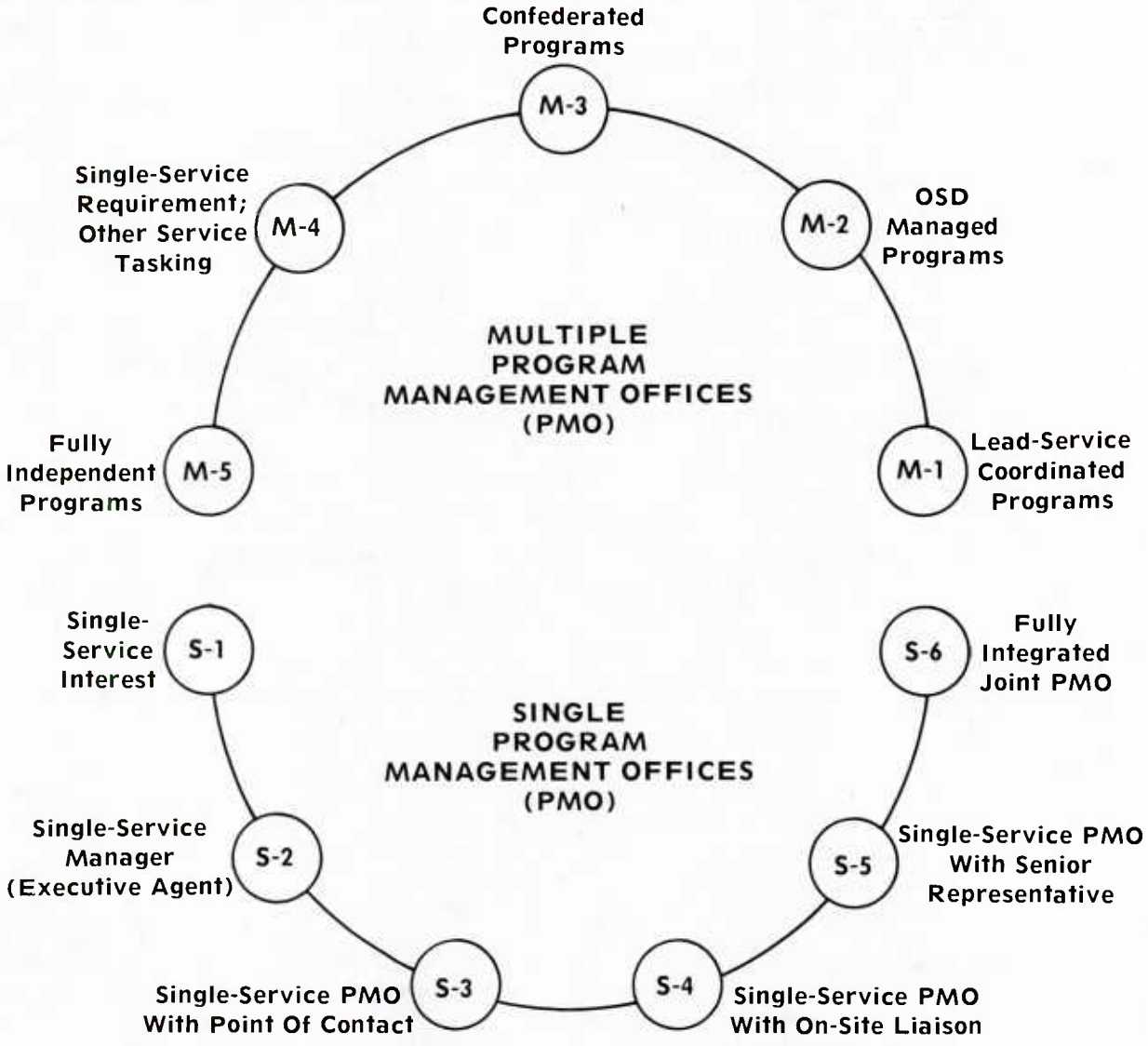

Table 1-1
JOINT SERVICE PROGRAM MANAGEMENT DOCUMENTS

TITLE	DESIGNATION			
	ARMY	NAVY	AIR FORCE	MARINE CORPS
Basic Policies and Principles for Interservice, Interdepartmental and Interagency Support	AR 1-35	NAVMATINST 4000.38	AFR 400-27	NAVMATINST 4000.38
Configuration Management	AR 70-37	NAVMATINST 4130.1A	AFR 65-3	NAVMATINST 4130.1A
Integrated Logistics Support Implementation Guide for DOD Systems and Equipment	TM 38-710	NAVMAT P-4000	AFP 800-7	NAVMC-2644
Interservice Formal School Training	AR 351-9	Cancelled	AFR 50-18	MCO 1580.7A
Joint Design to Cost Guide	AMCP 700-6	NAVMAT P-5242	AFR 800-11	NAVMAT P-5242
Management of Multi-Service Systems, Programs, and Projects	AMCR 70-59	NAVMATINST 5000.10A	AFSC/AFLC R 800-2	NAVMATINST 5000.10A
Standard Integrated Support Management System	DARCOM R 700-97	NAVMATINST 4000.38	AFSC/AFLC R 800-24	MCO P-4110.1B
Joint Service Automatic Testing Acquisition Planning Guide	DARCOM P 700-19	NAVMAT P-9404	AFSC/AFLC P 800-38	NAVMC-2719

Table 1-2
INDIVIDUAL SERVICE PROGRAM MANAGEMENT GUIDES

SERVICE	TITLE	DESIGNATION	DDC* NO.
ARMY	Material Acquisition Management Guide	None	ADA 046460
NAVY	Ship Acquisition Reef Points Project Managers Guide	None NAVMAT P-9494	Stock No. 0S18LP3947000 NPFC 5801 Tabor Ave. Phila., PA 19120
AIR FORCE	A Guide for Program Management A Guide for Management of Small Projects Acquisition Management Illuminators for System Program Offices Handbook for Managers of Small Programs Acquisition Logistics Management	AFSC Pamphlet 800-3 Published by each Product Division AFLC/AFSC Pamphlet 800-34	Not Available Not Available Not Available Not Available
MARINE CORPS	Project Officers Guidebook	None	Not Available

*Defense Documentation Center

Table 1-3
JOINT PROGRAM TYPES AND CHARACTERISTICS

Program Destination		Characteristics
S-1	Single-Service Interest	Single-service interest; no interest or participation by any other service; not a joint program
S-2	Single-Service Manager (Executive Agent)	Single-service program; interest from other service(s) manifested by their consumption or use of end product; all program direction and funding has single source
S-3	Single-Service PMO with On-Site Liaison	Single-service program; interest from other Service(s) manifested by their designation of a Service point of contact (POC) for maintaining liaison
S-4	Single-Service PMO with On-Site Liaison	Single-service program; interest from other service(s) manifested by their assignment of a full-time (PCS) liaison officer
S-5	Single-Service PMO with Senior Representative	Single-service program; representative(s) from other service(s) assigned to PMO; all authority and responsibility to program manager stems from parent service, no formal coordination of requirements, charter, etc.
S-6	Fully Integrated Joint Program Office (JPO)	Multiservice participation, integrated JPO, staffed by all participating services, directed by program manager assigned by lead service. Participating services may perform some program functions, but on behalf of JPO, not for separate service program. MODEL JPO
M-1	Lead-Service Coordinated Programs	Programs exist in more than one service; one service PMO provides coordination among all programs; executive authority does not reside with coordinating PMO
M-2	OSD Directed Programs	More than one service has program in the technical discipline. A lead service is not assigned. The objectives of the programs may not be the same. Direction, coordination and/or standardization is executed not through a designated lead service, but by the OSD, either directly, or through a PMO established for the purpose and reporting, not to a military service acquisition commander, but the OSD
M-3	Confederated Programs	More than one service has at least one program in the generic technical area and the end products of which are used in allied but separate warfare areas. The PMOs characteristically share technical information and development data
M-4	Single-Service Requirement—Other Service Tasking	Single service has specific requirement, but acknowledging that another service has preeminent capability or interest in execution of a part of the program objective, arranges for that segment to be executed by the other service.
M-5	Fully Independent Programs	Although objectives, requirements, and/or technical discipline involved in separate programs may have commonality, each service has its own program to develop/acquire a system

CHAPTER 2
Joint Program Initiation

Rationale for Joint Programs

The future promises an increasing number of joint acquisition programs. They can squeeze more out of austere research, development and production budgets, simplify logistics operations, and improve combat capability. They are strongly supported and encouraged by the Office of the Secretary of Defense and the Congress.

Yet few acquisition programs are joint from their inception. Most are preceded by individual Service efforts, often after much research and development have been accomplished. The reasons for advocating a joint program are many and varied but are ultimately reducible to some operational or economic advantage to the DOD. Typically, one or more of the following factors is at work:

- *Coordination of Efforts*. Coordination reduces duplication of effort, improves exchange of technical information, and channels individual Service efforts into mutually supporting programs.
- *Interoperability of Equipments*. Especially in the areas of command and control, communications, and intelligence, the interdependence of air, ground, and naval forces necessitates joint definition and central control of system interfaces.
- *Reduction in Development Costs*. All other things being equal, one development program should be less expensive than two. If the requirements of the Services are compatible, and consolidations of programs does not increase risk unduly by closing out alternatives, it makes sense to fund one joint program, rather than multiple, single-Service efforts.
- *Reduction in Production Costs*. Consolidation of the Services' production requirements should lower unit price.
- *Reduction in Logistics Requirements*. Standardization across Services offers potential for both reducing support costs and improving the support provided to operating forces.

The Marine Corps, having few research and development resources of its own, has traditionally sought to fulfill its materiel needs through multi-Service acquisition programs. Among the other Services, however, few programs become joint without some initiative by the Secretary of Defense or the Congress.

Typically, the Under Secretary of Defense for Research and Engineering (USDRE) writes a memorandum designating one Service the Executive, or Lead, Service and directing it to charter a joint program. In at least two cases, a formal DOD directive has been issued.[1] Less formal, but no less compelling, direction is given to the Services during program or budget reviews. The Services negotiate the ground rules of the joint program and agree to assignment of program authority and responsibility. The implementation of OSD direction is different in each of the Services. The Army and Navy simply forward by memorandum USDRE's direction to the development and acquisition activity specified in Table 2-1 via the chain of command. In the Air Force, HQ USAF directs major command participation, either as lead or supporting elements, via Program Management Directives (PMD). Further delineation of participation below major command level is promulgated by Form 56 within AFSC, and Program Action Directive (PAD) within AFLC.

Inter-Service Agreement on Joint Program Initiation

Inter-Service negotiation and agreement on a joint program can be accomplished at any of several echelons in the Services' organizational hierarchies: the Service secretariats, the Service headquarters, the materiel development and logistics commands, or their commodity-oriented subcommands. Table 2-1 shows the materiel development and acquisition organizations of the same level in the hierarchy, such as the Assistant Secretaries of the Army and Navy. However, exceptions do occur. For example, the Commanders of the Naval Air Systems Command and the Air Force Systems Command have agreements on acquisition of air-to-air missiles.

If there is a general rule, it is to agree that the lowest level agreement is practicable, and that varies from program to program. However, there are two advantages to agreements at the Service headquarters level: (1) it is the level at which operational requirements are validated and translated into equipment needs; and (2) it is the level at which funding

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Table 2-1
MILITARY SERVICES' ORGANIZATIONS FOR MATERIEL DEVELOPMENT AND ACQUISITION

	ARMY	AIR FORCE	NAVY	MARINE CORPS
Service Secretariat	Assistant Secretary of the Army (Research, Development and Acquisition)	Assistant Secretary of the Air Force (Research, Development and Logistics)	Assistant Secretary of the Navy (Research, Engineering and Systems)	Assistant Secretary of the Navy (Research, Engineering and Systems)
Service Headquarters	Deputy Chief of Staff for Research, Development and Acquisition	Deputy Chief of Staff for Research, Development and Acquisition	Deputy Chief of Naval Operations for Research, Development, Test and Evaluation	Deputy Chief of Staff for Research, Development and Studies Deputy Chief of Staff for Installations and Logistics
Materiel Development and Logistics Commands	Department of Army Materiel Development and Readiness Command	Air Force Systems Command Air Force Logistics Command	Naval Material Command	Naval Material Command
Army Commodity Commands Air Force Product Divisions and Centers Navy Systems Commands	Research and Development Commands: Armament Aviation Communications Electronics Mobility Equipment Tank/Automotive Readiness Commands: Armament Communications Tank/Automotive Troop Support Research, Development and Readiness Commands: Missiles	Systems Divisions: Aeronautical Systems Division Armament Division Ballistic Missile Office Electronics Systems Division Space Division Air Force Acquisition Logistics Division Air Logistics Centers: Ogden Oklahoma City Sacramento San Antonio Warner Robins	Naval Air Systems Command Naval Electronic Systems Command Naval Facilities Engineering Command Naval Sea Systems Command Naval Supply Systems Command	Marine Corps Development and Education Center

priorities are established. As all joint program managers soon learn, nothing is more important to the success of a joint program than inter-Service agreement on requirements and funding. The major disadvantage of inter-headquarters agreements is that staff consideration can take a long time.

When agreement is reached at either the Service headquarters or secretariat level, it is usually documented by a memorandum of agreement (MOA). There is no typical content or format for a MOA. It may be a long document defining all the ground rules for the joint program, much as would a charter. It may be very brief, covering only key areas of agreement, such as designation of the Executive Service and sharing of funding responsibility. Frequently a program will have several MOAs associated with it, each covering a different topic.

Joint Program Charters

Preparation

The charter, once promulgated, is the foundation of a joint program. It establishes the program and announces to all concerned the responsibility and authority assigned to the program manager and the intended relationships among the participating Services. Whenever possible, the prospective program manager should take the lead in shaping these assignments, preferably by drafting the charter himself. An example of a joint charter for the ASPJ is attached in Appendix B.

Establishing the Program Manager's Authority

While the charter cannot guarantee that the joint program manager will have authority commensurate with his responsibilities, care can be taken to insure that the charter does not *deny* him the authority needed to manage, rather than merely to coordinate the joint program. Specifically, the program manager must have adequate authority:

- to make trade-offs between cost, schedule, supportability and performance within bounds established for the program
- to identify program funding needs and to control funds allocated to the program
- to determine and control hardware and software configuration
- to communicate directly with other Services and Government agencies
- to manage his military and civilian workforce

Promulgation

Charters for joint programs are normally promulgated by the Executive Service. Although the JLC "Memorandum of Agreement on Management of Multi-Service Systems/Programs/Projects" calls for joint approval of joint program charters, jointly signed charters are rare. The program manager should coordinate the charter with the Participating Services at the materiel development command or Service headquarters level and try to obtain formal concurrence. However, it should be anticipated that such coordination is likely to take a long time, months rather than weeks.

For major programs, Army charters are approved by the Secretary of the Army, Navy charters, Navy Acquisition Executive, i.e., the ASN (RE&S) or the ASN (S&L) depending on the nature of the particular acquisition, and the Air Force program management directives by the Deputy Chief of Staff (Research, Development and Acquisition) or the Deputy Chief of Staff (Logistics and Engineering). For non-major programs, the chartering authority is delegated to the materiel development or logistics commanders according to specific Service practices. (The Services' hierarchies of non-major programs are illustrated in Tables 5-2 through 5-5.) On a few occasions, program charters have been promulgated directly by OSD, but that is unusual and has occurred primarily when OSD wanted to coordinate independent Service programs.

Contents

Joint programs are exceptions to the Services' normal acquisition practices. Thus, the joint program charter must include both those elements essential to any charter and those needed to define specific relationships between the Participating Services. The extent to which the latter must be defined in the charter depends on the circumstances surrounding establishment of the joint program. If, at the inauguration of a joint program, there exists a major issue involving responsibility, authority, or inter-service relationships, it should be resolved in the charter, or it will haunt the program throughout its life.

Essential Elements. The following elements are the minimum which must be addressed in the charter:

- —Designation of the joint program
- —Statement of the program objective
- —Definition of the program manager's authority, responsibility, and accountability
- —Specification of program resources and funding agreements
- —Definition of the Services' joint or unilateral responsibilities for program execution
- —Description of the relationships of the joint program with other programs, supporting organizations, and supported organizations
- —Identification of the chain of command for reporting and for resolving program issues
- —Reporting requirements (type, format, and frequency)
- —Project office organization and initial staffing
- —Requirement to establish joint operating procedures (JOP). Minimum contents may be specified

Optional Elements. The following elements are generally optional, but may be essential for success of some programs. In fact, writers should consider making these elements essential. Since each element is a potential problem area, mandatory inclusion will eliminate the need for clarification at a future time:

- —Assignment of the deputy program managers from the Participating Services, definition of their responsibility and authority, and designation of their rating officials
- —Methods for resolving conflicting requirements or objectives of the Services involved
- —Creation of joint committees for coordination or approval of key aspects of the program (e.g., requirements, funding, source selection, test and evaluation plans, and configuration)
- —Performance evaluation of personnel

Review and Update

As a joint program progresses through the acquisition process, management needs and the relationships of the participating Services probably will change. Therefore, the joint program manager should review the charter periodically, at least annually, to ensure that its descriptions of program mission, responsibilities and authority of the program manager, and inter-service relationships are still accurate. If not, the charter should be revised.

Footnotes

1. Department of Defense Directive 4120.11, *Mobile Electric Power (MEP) Generating Sources: Standardization of,* December 14, 1973, and DOD Directive 5148.7, *Program Charter, TRI-TAC.*

CHAPTER 3
Joint Requirements

No aspect of a joint program is more critical to the program's success than the statement of operational requirements. It is the cornerstone of a joint program. The premise of a joint program is that there is sufficient commonality in the services' requirements that a joint effort will be beneficial. The challenge is to develop a set of requirements that will satisfy the operational needs of all participating services without unduly compromising individual service needs, imposing parochial technical approaches that will hamstring the program, or developing a product none of them can afford to buy.

Requirements Documents[1]

The basic requirements document for a major acquisition program is the Justification of Major Systems New Starts (JMSNS). A JMSNS identifies a specific deficiency in a mission area, the priority assigned to correcting the deficiency, and the magnitude of resources needed to correct the deficiency. A brief outline of a JMSNS is shown in Table 3-1. A joint JMSNS documents major deficiencies in two or more services. Approval of a JMSNS is a prerequisite for initiation of a major system acquisition program.

A JMSNS is the document upon which the Milestone 0 decision is based. It identifies and defines: (a) a specific deficiency or opportunity within a mission area; (b) the relative priority of the deficiency within the mission area; (c) the Defense Intelligence Agency (DIA) validated threat forecast or other factor causing the deficiency; (d) the date when the system must be fielded to meet the threat; and (e) the general magnitude of acquisition resources that the DOD component is willing to invest to correct the deficiency. A JMSNS is required for each major acquisition, including system modifications and additional procurement of existing systems, which the DOD component anticipates will cost in excess of $200 million (FY 1980 dollars) in research, development, test, and evaluation (RDT&E) funds or $1 billion (FY 1980 dollars) in procurement funds. A JMSNS is not required for programs, regardless of size, directed toward developing and maintaining a viable technology base. HQ USAF uses preconceptual review to determine if a JMSNS is needed. If the data indicates a major system acquisition program or Air Force Designated Acquisition Program (AFDAP) may result, a JMSNS is required. (Note: Chapter 11 covers in more detail the changes which have resulted from the DOD Acquisition Improvement Program).

The deficiency or opportunity identified in a JMSNS should be defined as narrowly as possible to allow a reasonable probability of correcting the deficiency by acquiring a single system. Defining a broad architecture of systems to counter projected threats in a mission area is part of the ongoing analysis of mission areas rather than a part of a specific acquisition program. Though the scope of the deficiency identified in a JMSNS shall be narrowly defined, solutions to the problem shall not be specified. Alternative concepts and associated risks shall be evaluated in the Concept Exploration phase.

There may yet remain some uncertainties about what constitutes a good JMSNS and whether the JMSNS will replace or augment some of the existing requirements documents in the services. Since the use of the JMSNS is restricted to major acquisitions, operational requirements for less-than-major acquisitions will probably continue to be stated in service-peculiar requirements documents which tend to be more detailed and more weapon-system-oriented (vice mission-oriented) than a JMSNS. This same practice is likely to hold true for joint acquisitions: major acquisitions will be supported by a joint JMSNS; less-than-major acquisition will be supported by a joint operational requirement (JOR), or similar document, which is more detailed and more weapon-system-oriented than a JMSNS.

In the Army, the JMSNS is the requirements document only for the conceptual development phase of a program. A letter of agreement (LOA) is the requirements document for the demonstration and validation phase. A required operational capability (ROC) or letter requirement (LR) defines requirements for the full-scale engineering development phase. Primary responsibility for preparing requirements documents is assigned to the Training and Doctrine Command (TRADOC). At Headquarters, Department of Army, the Deputy Chief of Staff for Operations and Plans (DCSOPS) has Army General Staff responsibility for requirements documents.

Table 3-1
JUSTIFICATION OF MAJOR SYSTEMS NEW STARTS

A. MISSION
1. Mission areas
2. Mission element need

B. THREAT OR BASIS FOR NEED

C. EXISTING AND PLANNED CAPABILITIES TO ACCOMPLISH THIS MISSION

D. ASSESSMENT OF NEED
1. Deficiency in existing capability
2. Exploitable technological opportunity
3. Force size or physical obsolescence of equipment
4. Vulnerability of existing systems

E. CONSTRAINTS
1. Timing of need
2. Relative priority within mission area
3. Logistics, safety, health, energy environment, and manpower considerations
4. NATO and DOD standardization and interoperability
5. Potentially critical interdependencies or interfaces
6. Industrial base improvements or critical materials required, or both, if any.

F. ACQUISITION STRATEGY
1. The order of magnitude of resources the DOD Component is willing to commit to satisfy the need. This resource estimate is intended to serve as a frame of reference and will not be considered a threshold.
2. Approach to concept exploration, P^3I, tailoring of the strategy to accommodate unique program aspects.
3. Extent of design competition contemplated in subsequent phases.
4. Timing of Milestone I.
5. Approach to reduction of support task.
6. Strategy for constraining cost growth in production, maintenance, and operation.

The Navy is using the JMSNS as the principal requirements document for major acquisition programs. The JMSNS is prepared by one of the Mission Sponsors, who are Deputy Chiefs of Naval Operations (DCNO) or Directors responsible for the various warfare areas (e.g., DCNO (Air Warfare) or Director, Naval Intelligence).

In the Air Force, requirements originate in the operating commands, such as the Tactical Air Command, where they are documented as statements of operational need (SON). Those SON that may lead to major system acquisition programs are transformed into JMSNS by the Deputy Chief of Staff Operations, Plans, and Readiness) (AF/XOX) and the Deputy Chief of Staff (Research, Development, and Acquisition) (AF/RDQ).

The procedures established for processing the JMSNS call for the originating service to submit the MNSNS to the Defense Acquisition Executive (DAE) not later than the POM submission in which funding is included for a major system new start.

When a Joint or OSD/OJCS JMSNS is submitted, the SECDEF decision will be documented in a Secretary of Defense Decision Memorandum (SDDM).

The SDDM shall specify the lead DOD component and provide explicit guidance on the responsibilities of the participating DOD components, including threat support. The lead DOD component will assign the program manager and request the other participating DOD components to assign deputy program managers. The lead DOD component will also establish program objectives by promulgating a program charter after coordinating with the other participating DOD components.

Requirements for major tactical command and control, and communications (C^3) systems are processed differently than requirements for other systems. Because of the interoperability of requirements of C^3 systems and their implications for unified commands, the Joint Chiefs of Staff are specifically charged with validating, rather than merely commenting on, C^3 requirements.[2] This validation is usually based on a statement of requirements that is much more detailed than a JMSNS. Use of the detailed statement of operational requirements, however, does not preclude use of a JMSNS prior to program initiation. When a JMSNS or Joint-JMSNS is used for a C^3 system acquisition, processing can be expected to be the same as for any other JMSNS or Joint-JMSNS.

The DOD has also established special arrangements for processing armaments and munitions requirements. An Armament/Munitions Requirements and Development (AMRAD) Committee has been established by the Deputy Secretary of Defense. The committee is staffed by members of the research and development directorates of the separate services and reports to the Under Secretary of Defense for Research and Engineering.[3] Although the objectives of most joint programs are outside the purview of AMRAD, the committee has more than ten years' experience in reconciling diverse requirements and has established a protocol for their harmonization. A program manager faced with the task of developing or revising requirements for a joint program may find the committee's experience valuable.

The Program Manager's Role in Establishing Requirements

The logical, and presumably, intended sequence of events in an acquisition is for the JMSNS or other requirements document to be approved prior to initiation of the program and appointment of the program manager. In practice, events may not occur in that order. Many are being written to support existing programs. Furthermore, because many joint programs are created by merging two or more single-service programs, or by existing Joint Program Offices, the joint program manager may find himself involved in preparing, coordinating or revising joint JMSNS or JOR. In any case, he should ensure that the statement of requirements meets the needs of the joint program.

Several important characteristics of joint requirements documents must be kept in mind. They are negotiated statements. The tendency is for each service to overstate or overspecify requirements to ensure that its needs are met. The working of the requirements may be a compromise to which each service may agree, but interpret differently. Some key aspects of the requirements may be omitted, either through oversight or because agreement was not possible. Finally, many requirements of each of the services will not be specified in any requirements document, but will come to light as the program progresses and the requirements are translated into engineering specifications. For example, the scope of work defined in a contract may incorporate by reference Military Standard Specifications which are standard in one service, but which either conflict with or fail to meet the needs of another service.

At the outset of a joint program, the joint program manager should conduct a detailed technical requirements review that examines mission needs, operational concepts and environments, and performance parameters. He should ensure that requirements are understood, that conflicts are resolved, and that there is sufficient latitude to make the trade-offs essential to any program's success. This review should accomplish the following:

—identify the similarities and differences in the services' requirements and in their operational environments

—force a clear distinction between the "like to have" and "must have" requirements

—identify any requirement that mandates a specific technical approach

—identify areas of technical risk or uncertainty

—identify the similarities and differences in the services' logistic concepts, requirements, and procedures, including their approach to the implementation of the life-cycle cost concept

Once the requirements of each service are well understood, the joint program manager should define the set of essential requirements which is most demanding in terms of cost, schedule, and performance criteria. This will require determining which requirements are subsumed by others. It will also require determining the extent to which commonality of hardware and software, frequently an explicit or implied goal of a joint program, is a valid requirement and is achievable. Some joint programs will be considered successful only if they develop identical or nearly identical systems for use in all services. The value of other joint programs, however, may be only in sharing the costs of concept formulation and validation or in coordinating the engineering development of systems peculiar to each service and ensuring their interoperability; trying to develop identical or nearly identical systems for all the services may frustrate the program and lead to its failure.

The preparation for each milestone review (see Chapter 5, Program Review) should include a re-examination of the same items reviewed at the initiation of the joint program. This re-examination should determine not only that the participating services; perceptions of the requirements have not changed, but also that the threat or other basis for establishing the system's need remains consistent with the initiating need. A revised threat assessment will bring about a redirection of other elements of the JMSNS (or OR). Although the program manager is frequently advised to avoid change, he must take the opportunity afforded by the review process to ensure that his program is meeting the current and projected threat and that test and evaluation will demonstrate the fulfillment of current and projected mission requirements.

In dealing with the contractor, the joint program manager must ensure that the statements of program requirements—that is, interpretation of requirements within the scope of the contract—emanate from one source: his PCO. There must be no other source, official or unofficial, stated or implied. This is the only way the joint program manager can maintain control of the program and hold the contractor accountable.

Footnotes

1. Shortly before the Joint Commander signed this guide, the Deputy Secretary of Defense, Frank C. Carlucci signed DOD Directive 5000.1 on 29 March 1982. Also, on 12 April 1982, the Under Secretary of Defense, Research and Engineering, Richard D. DeLauer, promulgated by memorandum major defense system acquisition program documentation format. Because of the close proximity of these events, the policy and requirements of these documents may not be fully included in this guide. Accordingly, the reader should seek additional guidance from these source documents.

2. Department of Defense Directive 4630.5, "Compatibility and Commonality of Equipment for Tactical Command and Control, and Communications."

3. The members of the AMRAD Committee are each 0-6 rank officers on permanent assignment from the following service headquarters organizations: Army—Deputy Chief of Staff for Research, Development and Acquisition (DAMA-AMRAD); Navy—Office of Research, Development, Test and Evaluation (OP 098W); Marine Corps—Deputy Chief of Staff for Research, Development and Studies (MC-RDS); and Air Force—Deputy Chief of Staff, Research, Development, and Acquisition (AF/RDQRM).

CHAPTER 4
Acquisition Strategy

Acquisition strategy is the conceptual basis for all planning for accomplishing specified goals and objectives to attain a mature and logistically supportable weapon system or equipment. It gives an overview of management concepts and program manager (PM) actions planned to ensure satisfaction of the approved mission need. The acquisition strategy covers every phase of the development of a major weapon system to include operation and maintenance considerations. At any stage of the acquisition process, the strategy must address the remaining life of the program. Many of the details of the strategy, however, need only be planned for the imminent acquisition phase.

Because no two programs are exactly alike, each requires a tailored acquisition strategy. A joint program offers another dimension of the acquisition strategy for management consideration. A joint program strategy can be structured from the beginning if the proper multiservice requirements fit can be negotiated. DOD Directive 5000.1 requires that "acquisition of equipment satisfying DOD component needs should also include consideration of interservice and intraservice standardization and interoperability requirements." This consideration should be made prior to the issuance of a secretary of defense decision memorandum (SDDM) specifying a lead service and providing explicit guidance on the responsibilities of the participating services.

Chapters 2 and 3 discuss joint program initiation and requirements. It is sufficient to summarize from these chapters that when the early stages of the acquisition process are conducted properly, the following goals should be achieved:

—The system's performance specifications match its mission requirements.

—Alternate ways of performing the mission are explored before systems are selected.

—A variety of associated technologies and subsystems are considered, and the development is initiated so that the technology will be available to meet new threats and needs.

Joint service programs allow for development of competing alternate technology approaches by the participating services. The JMSNS process tends to reduce the influence of service and contractor advocacy in deciding what systems are to be acquired and help ensure that alternatives for satisfying the mission need are considered.

Program Management Authority

The program manager's authority to conduct the joint program should be delineated in a joint program/project manager charter as required in AFLC/AFSC R 800-2/AMCR 70-59/NAVMATINST 5000.10A.[1] Normally, this will be based on a secretary of defense decision memorandum. The lead service assigns the program manager and requests the other participating services to assign deputy program managers. The lead service also establishes the program's objectives by promulgating the program charter after coordination with the participating services.

Developing the Acquisition Strategy

Acquisition strategy defines the interrelationship between management, technical, business, resource, force structure, support, testing, and the aspects of the program.

The primary value of strategic planning is the interactive process through which the final product is developed. The acquisition strategy evolves through repetition as a dynamic management tool which must be kept current throughout the life of the program. It must also address typical management issues from development to production that assess the impact of different levels of funding, problems in testing, changes in requirements, control of engineering changes, length of product maturation, and effects of lead times. The acquisition strategy should delineate realistic responses to program variances considered disruptive to key program efforts.

The acquisition strategy should reflect the full scope of the program with sensitivity to the acquisition process, imagination, and practical judgment of program managers. Whenever large procurement quantities and relatively high unit costs are part of the acquisition, the program manager has a full range of acquisition strategies available to structure his program. He should also consider the use of competition to obtain the trade-offs between cost, performance, and schedule supportability to the best ad-

Figure 4-1
OUTLINE OF NAVMATINST 5000.29 ON SYSTEM ACQUISITION STRATEGY PLANNING

I. OBJECTIVES AND CONSTRAINTS

- A. Statement of need—synopsis of JMSNS
- B. Summary of technical development—advances in technology required
- C. Relationship to other programs
- D. Program objectives—quantifiable objectives as parameters and non-quantifiable objectives as qualitative judgments
- E. Assumptions—interrelated events with probabilities associated with their occurrence
- F. Constraints—variable and non-variable constraints, resources required vs. planned resources available
- G. Major threat/risk factors

II. STRATEGY TO ACHIEVE OBJECTIVES

- A. Dealing with constraints
- B. Anticipation of changes in major threat/risks
- C. Development of alternatives
- D. Selection among alternatives and the timing of key selection decisions—maintenance of competition, expansion of the industrial base, integrated logistics support (ILS), and affordability
- E. Utilization of organizational assets—industry, in-house labs, universities, etc.
- F. Planning and control of critical program activities—commitment and contingency planning, responsiveness to changes

III. IMPLEMENTATION

- A. Developing and scheduling of interactive plans
  1. Funding, budgeting, and business
  2. Contracting
  3. Test and evaluation
  4. Integrated logistics support
  5. Configuration and technical management
  6. Work breakdown structure
  7. Software
  8. R&M
  9. Personnel, training, and force development
  10. Technical developments and assessment

vantage of his program where there is a net benefit to the government.

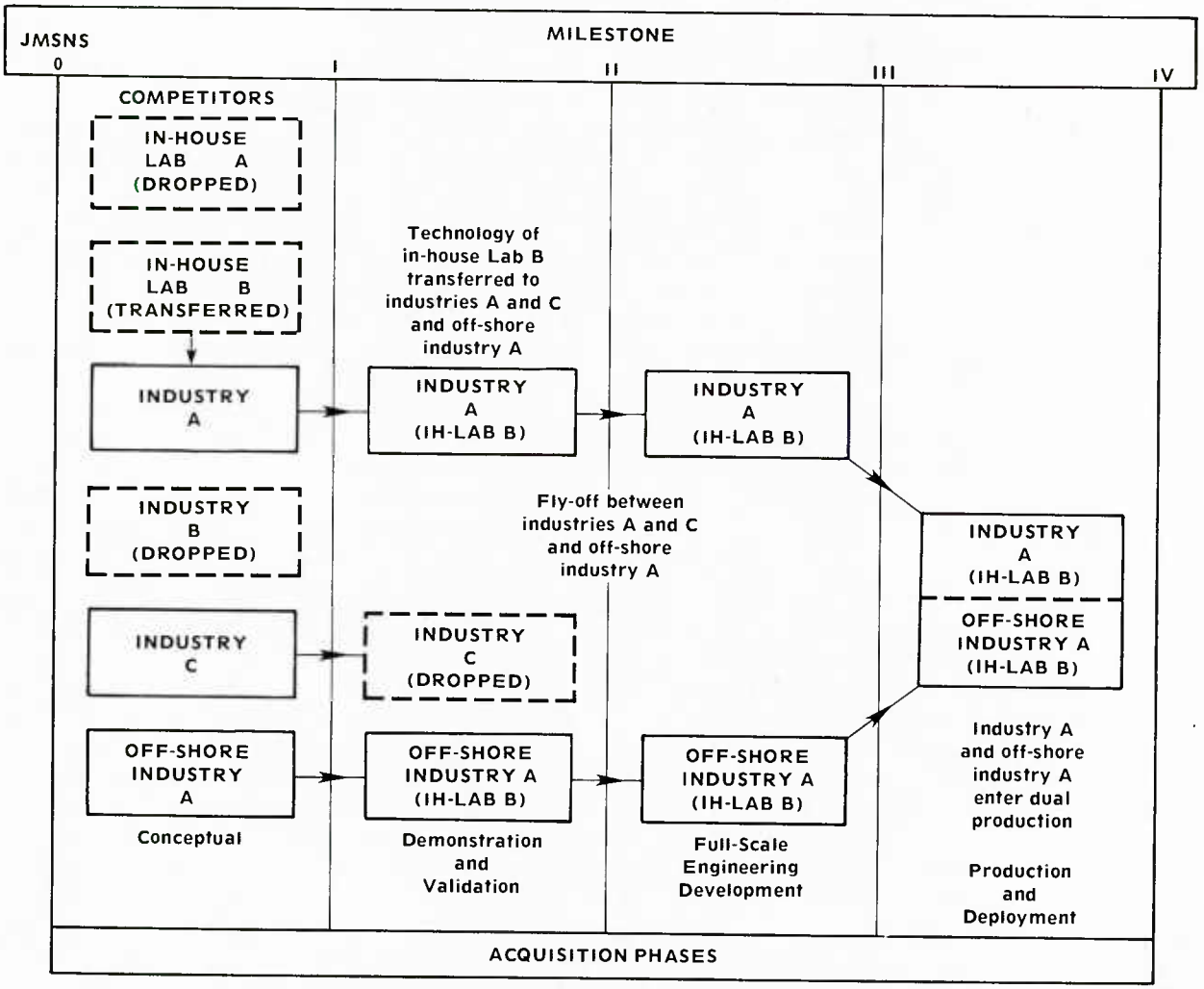
The acquisition strategy should not contain planning details; it is intended to serve as an overall strategy for functional implementation plans. The acquisition strategy for the airborne self protection jammer (ASPJ) is approximately 20 pages long. Formulated by the PM with the assistance and advice of acquisition, contracts, and other functional specialists, the acquisition strategy is coordinated with the appropriate materiel develoment commands (DARCOM, AFSC, AFLC, NAVMAT). Concurrence at the materiel development commands assures development and establishment of a consensus and advocacy for the acquisition strategy early in the acquisition process. Figure 4-1 illustrates the suggested topics which might be included in the acquisition strategy.

The acquisition strategy should be developed immediately following Program Initiation and the appointment of a program manager. It will become a source plan for the System Concept Paper (SCP) at Milestone I. It will address how program alternatives are to be developed and evaluated, and how selection of the most promising alternative(s) will be made. The acquisition strategy must be tailored to the unique requirements of a specific acquisition effort and the different phases of the acquisition cycle. It is *not* a formal document and *does not* require formal higher-level approval (except for the Navy, where CNM approval is required). However, the program manager is required to keep all management levels informed of his acquisition strategy and to summarize specific areas at milestone decision points as part of the DCP/IPS. Prior to Milestone II, the program manager should complete his acquisition strategy for full-scale development and production. The strategy for production must be updated prior to Milestone III.

Technical Advances

The acquisition strategy should include a listing of critical pacing technology advances required to satisfy the program thresholds. The initial acquisi-

Figure 4-2
METHODS TO MAINTAIN COMPETITION DURING THE LIFE CYCLE



tion strategy after Program Initiation may only contain a few pacing technology advances required since alternatives have not yet been explored. As the concept formulation phase proceeds, however, advances should become defined in detail as the preferred alternatives are considered. The critical pacing technology advances required for each alternative drives the technology risk assessment in the analysis of the alternative concepts. Once the preferred alternative(s) is chosen at Milestone I, the advances required should be well known and an evaluation of risks for developing those technologies to the point of being able to meet the performance, cost, schedule, and supportability thresholds should be understood. The program manager must then manage these risks through the acquisition strategy by assigning and controlling critical resources (time, money, personnel) to achieve the required technology advances with special attention to the critical pacing technologies.

When technical risk and progress are acceptable, parallel, short-term fixed-price contracts are sometimes used to evaluate and explore selected concepts. This can aid in reducing technical uncertainties for alternative approaches. Unsuccessful approaches are eliminated by continuous evaluation of contractor and in-house laboratory efforts. Figure 4-2 illustrates parallel development efforts to maintain competition. Two government laboratories, three industry participants, and one European contractor develop and investigate feasibility of various concepts. The successful concept feasibility study from one government laboratory is transferred for the demonstration and validation phase. A fly-off between the three participants' prototypes results in selection of one full-scale engineering development

approach, with a teaming arrangement concluded between the European industrial partner and the remaining U.S. industry participant, resulting in a dual-production agreement.

Value engineering can be a useful tool for promoting cost reduction in the design and production phases that include government and contractor engineering efforts. Besides a vigorous in-house program, an incentive clause is included in the contract by which any cost savings accrued by a contractor because of his value engineering program is shared with the contractor. Value engineering uses various analytic techniques to eliminate or reduce the cost of a component in the system not necessary to maintain required performance, quality, maintainability, reliability, standardization, or interchangeability.

Logistics planning and programming strategy will be directed towards avoiding significant supportability and readiness problems. The anticipated problems are to be identified as critical technology advances when they are sufficiently significant as to affect performance thresholds for the system. In addition, industry capacity to produce critical components, long subcontractor leadtimes, use of commercial systems and components, and use of commercial logistics support should be considered. Centralizing the defense logistics functions via single-service managers (such as the Army as the single manager for DOD conventional ammunition production and inventory), consolidating management of individual non-consumable stock-numbered items of joint-service equipment by the Defense Retail Interservice Support Program, and expeditiously transferring consumable items to the Defense Logistics Agency and use of the standard integrated support management system (SISMS) should be considered for very early implementation in the initiation of the logistics program. By coupling the manpower and logistics functions, support of the weapons system has been emphasized in the acquisition process. Recent DSARC decisions have placed a major emphasis on reliability and maintainability and their relationship to manpower and logistics.[2]

The chapters on Logistics and Engineering Management discuss the various aspects of technical management to include core DOD requirements, configuration management, pre-planned produce improvement, software management, and the joint engineering review process.

Contract Strategies

The program may frequently be constrained by such factors as proprietary data, unique contractual terms, or other commitments made prior to the current acquisition strategy cycle. For example, technology developed by a contractor at his own expense under independent research and development program may be available to the government only if the contractor's participation in the program continues. The program manager should identify all such contracts or commitments and understand their influence on his program. Many programs depend upon other projects and government agencies for components to other projects. An example is the multiple launch rocket system (MLRS). The derivative vehicle used as the basis carrier is the responsibility of the Infantry Fighting Vehicles Systems Office. The project manager's office for Selected Ammunition at Picatinny Arsenal is responsible for modifying and supplying the M-42 submissions. Harry Diamond Laboratories is developing the SM-445 electronic fuse for the MLRS.

The program manager, via his contracting officer, has access to contract types that have evolved and survived the test of time. They have been designed to fit particular circumstances and, when appropriate, create a fair and equitable legal relationship for participants. Each major system acquisition program has unique features; differences in the contracting approach to harmonize time, cost, technology, and management environment can be expected. The acquisition strategy allows innovative contracting approaches. Through consideration of program goals and objectives, the PM should be able to examine and schedule contract decisions, refine contracting strategy to maintain competition when practical, utilize resources most effectively, and minimize development time by allowing contractors and in-house personnel to explore competing methods. Contracting is a tool in the acquisition process, not a substitute for management. The acquisition strategy must accommodate procurement lead times, preclude "technical leveling" between competing contractors, and provide innovation in proposal submittals for the next planned increment.

In order to refine the acquisition strategy, the Air Force finds it useful to convene a Business Strategy Panel (BSP), as outlined in AFSC Regulation 70-2, to have a corporate review of the overall strategy prior to its final formulation by the PM. The BSP discusses the overall acquisition strategy including guidance/requirements, schedule, funding, type of contract, special clauses, incentives, manufacturing, logistic, and product assurance aspects. The panel operates as an advisory body only. The purpose is to make the PM aware of the contracting and manufacturing lessons learned from acquisition experience and also suggest strategies that will best satisfy the program requirements and objectives.

After the acquisition strategy has been finalized

and the solicitation is being prepared, a Draft Request for Proposal (DRFP) may be used to solicit feedback from industry on the proposed acquisition. Offerors should be encouraged to challenge requirements that are considered significant cost drivers and to suggest revisions to performance, schedules, or other contractual requirements which could enhance the program. The industry feedback can provide significant cost savings and program improvements by deleting unnecessary requirements and overly complex elements.

Just as prototyping is designed to increase competition during the research and development phases of the systems acquisition process, several methods are used to increase competition during production. Breakouts involve competitive reprocurement of spare parts and components for weapon systems. Breakout has been especially cost effective when the weapon system producer is an assembler and piece parts are available from other vendors.

Under second sourcing, firm(s) performing development provide the government a complete technical data package (TDP). The DOD, after validating the drawings, specifications, and other technical information, transfers the package to other suppliers to establish production lines. Several production lines can be maintained throughout the production phase. Duplication of tooling and other setup costs normally require production runs sufficiently large to absorb these costs. Second sourcing or threat of second sourcing can be effective in reducing costs through competitive forces. It has been used successfully for small missiles (Sidewinder, Sparrow, and Bullpup), target drones, aircraft engines, and torpedoes.

Leader-follower procurement establishes contractual arrangements during the development phase for the contractor to transfer technology to other firms for establishment of production lines. This strategy has been used extensively in naval shipbuilding programs, the TOW missile system, and for transitioning production capabilities to our European NATO allies. The leader-follower concept has been used more for increased production capacity than increased competition, partly because of the difficulty in motivating contractors to transfer technical expertise with the threat of losing future contracts.

Codevelopment is an effective technology transfer policy to support cooperative development within NATO. Teaming of contractors provides benefits of price and technical competition. Teaming is especially useful when one contractor does not have all the resources to accomplish development and production.

Competition occurs during development and for initial and subsequent production contracts. Hence, a technology clause in the contract requires the transfer of data and technical information to the contractor winning the production competition should it not be the developer of the technology. The new firm pays royalties and compensation for technical assistance to the licensor. There are problems with this strategy because many companies are reluctant to part with proprietary information. This can result in critical production delays and in "buy-ins" by firms desiring trade secrets.

These strategies require the program manager to possess an adequate data base, a knowledgeable in-house team, and a detailed definition of the objectives of the contracting strategy. Unlimited patent and data rights must belong to the government for competition to be effective. Specific clauses for technology transfer must be inserted in the initial request for proposals and contract(s) to assure that proprietary rights are not a roadblock to competition. The contractor should at least be required to list all proprietary rights prior to the contract initiation. It is well recognized that a technical data package (TDP) is rarely adequate for recompetition; some form of technology transfer is normally required between contractors. Objectives in contracting strategy may be achieving lowest cost, enhancing performance, compressing the development schedule, enhancing competition, or a host of other quantitative and qualitative factors.

Multiyear contracting is a method of planned acquisition for periods of up to 5 years without having total funds available at award time. Program year quantities are financed initially with remaining quantities budgeted for in the Five Year Defense Plan. Contractors are protected against loss from a contract cancellation, for up to $5 million on nonrecurring costs, in case budgeted funds for future years' requirements are not appropriated. Multiyear contracting encourages competition by broadening the competitive base by participation of firms not otherwise willing to compete for lesser quantities, reduces costs by allowing a greater quantity base for facilitization for production and stabilization of the work force, and enhances standardization.

In considering the above techniques to enhance competition in development and production phases, an economic analysis is required to estimate net long-term savings and impact of technical competition. Non-recurring and start-up costs, learning-curve effect, technology transfer cost, inflation effects, and hardware costs must be considered. The government administrative personnel burden and

costs for additional engineering, contracting, and testing support should also be considered.

Using competition to drive research and development may result in shortening the acquisition cycle by allowing "concurrency," substitution of a shorter maturation phase with parallel completion of research and development. This meets the challenge to shorten the acquisition cycle time to field a system. Concurrency can be most effectively used on low-technology systems where high schedule and costs risk are acceptable due to urgency of the requirement to meet critical threats or needed capabilities. Examples of current systems employing a concurrency acquisition strategy are the Multiple Launch Rocket System (MLRS), Division Air Defense (DIVAD) Gun, Single Channel Ground and Airborne Radio Subsystems, Air Launched Cruise Missile (ALCM), and M-1 tank. Without concurrency on these systems, the initial operating capability (IOC) would be delayed 2-4 years.

Financial/Business Strategy

Once an acquisition strategy is accepted, the PM must budget funds to accomplish necessary tasks and structure the PM office to meet requirements in contracting, techical management, integrated logistics support, business management, etc. The PM must begin to manage the technical, cost and schedule risks, accommodating the funding and policy constraints, selecting and developing strategy alternatives, maintaining competition where practical, and controlling critical program events and activities. The acquisition strategy must also address utilization of available assets, to include support via matrix management, systems contractors, government laboratories, universities, and industry.

One method sometimes employed by program offices to reduce the number and frequency of contract actions they manage is to use an integrating contractor concept. This means a major contractor is selected essentially to coordinate activities of a family of other contractors working on various parts of the program.

DOD Directive 5000.1 directs that cost parameters be translated into design requirements. DOD Directive 5000.28, explains "design-to-life-cycle-cost" as an integral part of the program management, not a nonrecurring consideration.

Another OMB Circular, A-76, is the basic guide for use of in-house versus contractor support. It specifies that procurement from industry is the preferred method to satisfy the government's needs for products and services. The complexities of this policy are important when programs reach test and evaluation (i.e., who should do it, contractors or government agencies?) and deployment (i.e., should the services rely on contractor support?). The guidelines within DOD are not clear, and sometimes vary from service to service.

Affordability is another issue to be addressed by the program manager and the service. The Justification of Major Systems New Starts (JMSNS) must include an analysis of overall capability requirements, priority of need, and resources required. The acquisition strategy should address R&D, production and life-cycle cost goals, and thresholds as developed during the acquisition process. Adequate service need and priority is indicated by full funding of the program. At DSARC I, the program objectives memorandum (POM) and five-year development plan (FYDP) should indicate full funding of the R&D phases. Remaining R&D and production should be fully funded by DSARC II. The POM and FYDP should incude full funding for production and operations and support (O&S) by Milestone III.

Besides the DSARC issue of affordability, a linkage has been strengthened between the planning, programming, and budgeting system (PPBS) and the acquisition review process via the Defense Research Board (DRB). Established in April 1978, the DRB is chaired by the Deputy Secretary of Defense and has been expanded to 17 regular members, including all the members of the DSARC. Its charter include:

—Reviewing proposed planning guidance,

—Managing the program and budget review process,

—Advising the Secretary of Defense on policy, planning, program and budget issues and proposed decisions,

—Evaluating and reviewing high priority programs on a regular basis, and

—Assuring that major acquisition systems are more clearly aligned to the PPBS.

Strategy for Reducing Risk

At Milestones I, II, and prior to the production decision, Milestone III, all program efforts should be directed to reducing risk to an acceptable level. Since that is the fundamental purpose of research, development, test, and evaluation, much of the acquisition strategy will depend on what the program manager determines to be the major remaining uncertainties about cost, schedule, performance, and supportability. These uncertainties will change, as the program progresses, forcing reassessment and revision of the acquisition strategy. The acquisition strategy should specify those major problem or risk areas to be overcome to achieve the program objectives and goals and effect the selection of the most appropriate approach.

When program risks have been identified, the program manager should identify the four complementary methods available for reducing them to an acceptable level:
—ideas or concepts
—studies and analyses
—prototypes or demonstrations
—tests and evaluations
His blending of the four should be governed by the stage of the acquisition program, nature of risk, and the time and money available.

Competitive demonstrations are effective for evaluating alternative system designs. They must include reaffirmation that the alternative is meeting mission need and program objectives, and verify that the chosen concepts are sound and perform in the intended operational environment. Competitive demonstrations can provide an effective basis for selection of the systems or critical subsystems to be continued through full-scale engineering development.

The primary objective of the test and evaluation program as discussed more fully in the test and evaluation chapter is to discover significant technical and operating deficiencies to support the acquisition of reliable, effective, and supportable weapon systems for our operating forces. The development of a comprehensive test and evaluation master plan as an integral part of the acquisition strategy is essential. Data from joint test and evaluation (JT&E) programs, used to evaluate the system suitability for the intended mission, for force structure planning, for definition of needs, and for weapons improvement, is to be included, if appropriate. In addition, foreign weapons evaluation programs for candidate NATO and ABCA (American, British, Canadian, Australian) alternatives should be ascertained if systems being developed, or already developed, meet the requirement.

An Example of an Acquisition Strategy—The Airborne Self Protection Jammer (ASPJ)

The first approved acquisition strategy is the Airborne Self Protection Jammer, managed by the Advanced Tactical Aircraft Protection System Office, PMA-272. The Airborne Self Protection Jammer (ASPJ) is an on-board aircraft defensive electronics countermeasure (ECM) system used in conjunction with a warning receiver (LR-67 for USN and ALR-69 for USAF) and expendable dispenser (ALE-39 for USN and ALE-40 for USAF), to provide an advanced ECM suite for the F-14, F-16, F-18, EA-6B, and A6E. Because the ASPJ has to fit on these various aircraft, the ASPJ basic system is configured differently by using standard modules for the high- and low-band receivers (two separate modules), the processor, and the high- and low-band transmitter (two modules). The USAF Comprehensive Power Management System, which must interface with the ASPJ transmitter modules and the ALQ-131, is 90 percent common with the ASPJ receivers and processor. Specific OSD guidance was provided that all new ECM developments must be common for the USAF F-16, USN F-18, and other tactical aircraft in order to reduce the total cost of ECM programs by eliminating duplicative development costs, obtaining production economies of scale, and reducing operating and support costs. In addition to the aircraft listed above, the F-111, Army special mission aircraft, and NATO aircraft are candidate aircraft. Thus, PMA-272 is a joint Navy-Air Force project with Army and NATO RSI implications. Minimum project cost is derived from interservice commonality.

The ASPJ acquisition strategy follows the basic outline of the Naval Material Command Instruction 5000.29 on system acquisition strategy planning, Figure 4-1. The electronic warfare mission area, mission element need task, project objectives and guidance from higher authority are summarized in section I of the ASPJ acquisition strategy. The advances in technology required for the ASPJ to meet anticipated performance requirements are listed as traveling wave tubes, power supplies, microwave integrated circuits, microprocessors, pulse train trackers, and digitally tuned oscillators. Planning assumptions include the satisfaction of a multitude of user requirements for aircraft listed previously, commonality of equipment, interservice sharing of R&D funding shortfalls, required flexibility in the R&D and production phases to accommodate changing requirements and additional aircraft users, and a formal DSARC "new start" to consolidate the various joint user requirements. The relationship of ASPJ to candidate airframes and Pod programs is depicted by a probable ASPJ schedule compared with schedules of the candidate aircraft. The major risks and problems are achieving a common Navy-Air Force project completing the DSARC review, resolving R&D shortfalls, and integrating a common equipment with a variety of airframe users. The constraints for the ASPJ are that it must fit into the existing space in the candidate aircraft for ECM equipment; must function with existing USN and USAF warning receivers, the ALR-67 and ALR-69; and the unit cost of the system must be less than $400,000 to meet affordability criteria.

Section II of the plan details the strategy to achieve the stated objectives. Included in this section is the history of similar procurements, description of prob-

lems of proliferation of ECM equipment, appearance of an ECM industry, and recent congressional and OSD guidance on interservice commonality. Besides commonality, other acquisition objectives are that the ASPJ must: (1) be adaptive with sufficient growth potential to threat changes, (2) be affordable, (3) maintain cost control and cost goals, and (4) maximize operational availability. The industrial base assessment determined that 10 to 13 companies are in the competitive field. An assessment of the total number of anticipated jammers required for the USN aircraft, Army special mission aircraft, F-16, F-111, FB-111, and NATO is projected. The following relationships were defined to assess acquisition alternatives:

—cost/schedule/program risk

—production quantity/unit costs/average production cost/total production costs

—value and history of competition in ECM procurements

Several R&D program options are developed for the ASPJ with relative cost and risk for comparative analysis. The urgency of the requirement for the ASPJ, the reduction in retrofit costs for the F-18 if the ASPJ were available earlier, affordability, and risk are dominant factors in the development of the ASPJ acquisition strategy. To obtain sustained competition, teaming of companies, each capable of building the entire production end item, was conceived for the R&D phase. The winning R&D team would split and compete against one another for shares of production. The development program has a two-team design competition followed by a single-team fabrication and test phase. A moderate risk program structure was selected. Risk is to be controlled by having two teams (four contractors) compete in the design. Technical risk is to be reduced by prototyping or demonstration only on items that constitute significant design or packaging risk. Cost analysts are to predict the probable production cost of the system. Figure 4-2 illustrates the ASPJ competitive teaming scheme. Although competition is to be used as the best control, a series of incentives and controls is also to be used. The design phase contract is to be cost plus fixed fee (CPFF) with contractual controls imposed by cost sharing on overruns and progress reported by Cost Performance Report (CPR) reports. The fabrication phase contract is to be cost plus award fee (CPAF), with Cost/Schedule/Control Systems Criteria (CSCSC) used to measure contractor performance. An equitable first-production split will allow equal start-up efforts and provide a sufficient production quantity and rate to verify the design-to-cost goal. An unequal share split is anticipated after the first production contract to maintain competition controls. When the remaining production is reducted to a small quantity, a "winner take all" bid will close out production. Spares are competed separately. A cash incentive is planned for obtaining the design-to-cost goal.

Section III, implementation of the strategy, lists the following critical events: the acquisition strategy must pass OSD and OFPP reviews for compliance with OMB Circular A-109, the industrial members must voluntarily team, and the USAF and USN must conclude a joint service agreement so total production quantities are sufficient to support dual production sources. The DSARC is to be used as the vehicle to gain agreement on the acquisition strategy and USAF commitment to the joint program. The impact of various possible funding cuts is assessed during the design phase, fabrication and testing phase, and production on the acquisition strategy in terms of lost competition, increased program risk, and schedule delay. The acquisition strategy is to be updated before each major milestone, as a result of DSARC decisions or change in direction from higher authorities, of if serious contractor problems surface.

Conclusions and Recommendations

In the day-to-day press of carrying out his acquisition plan, the program manager should reserve for himself the occasional opportunity to reassess his strategy. He will want to verify that assumptions continue to be valid, that results of decisions have not taken the program in an unanticipated direction, and that the plotted course continues to be directed toward accomplishment of the program goals. The four keys to a successful program are a recognized need, an acquisition strategy that makes sense, management commitment to include funding stability, and program follow-through.

Footnotes

1. Previously DOD Directive 5000.1 did not address Joint Service Program Management. This void necessitated the Joint Logistics Commanders memorandum of agreement which was subsequently promulgated as a joint regulation (Joint Air Force Systems Command/Air Force Logistics Command/Army Materiel Command/Naval Material Command Regulation, "Management of Multi-Service Systems/Projects/Programs," AFSC/AFLC R 800-2, AMC R 70-59/NAVMATINST 5000.10A). The 29 March 1982 issue of DOD Directive 5000.1 on Major Systems Acquisition does include policy direction on Joint/Multi-Service Program Management. Because of this, the Service regulations cited above are being reviewed for possible cancellation, but procedural guidance is included herein.

2. Report of the Secretary of Defense to the Congress on the FY 1981 Authorization Request and FY 1981-1985 Defense Programs, p. 284.

CHAPTER 5
Program Review

This chapter discusses the series of reviews by successively higher echelons of authority at specified points in the acquisition of a military system. The purpose of this process is to allow a balanced assessment of the risks associated with a program at the completion of a well-defined development stage. Whatever this assessment is called—DSARC, NSARC, ASARC, AFSARC, In-Process Review, CNO Executive Board (CEB) Review, Command Assessment Review, etc.—its fundamental objective is to ensure that all areas of uncertainty are carefully considered before a commitment is made to proceed to the next stage. These areas of uncertainty may include:

—*Mission Uncertainty:* Does the threat, as orginally assessed, still exist? Does the mission requirement adequately identify and balance or mitigate the threat?
—*Technical Uncertainty:* Are the technical objectives of the system feasible with respect to the time and resources available to be expended?
—*Program Uncertainty:* Is the acquisition management strategy consistent with program goals and resources?
—*Background Uncertainty:* What are the factors external to the program, e.g., change in national goals, change in political or economic climate, change in DOD or service policy, which can affect the program? Are there impacts consistent with program objectives and resource commitment?
—*Logistics Uncertainty:* Will the system be supportable at deployment under the logistics philosophy and strategy in use?

These reviews are scheduled exclusively according to the completion of specific program phases. They are conducted independently of the planning, programming, and budgeting process. They do not seek to assign relative precedence among several programs, but rather to look at the issues of only one program. Have uncertainty levels at the particular stage of development been reduced sufficiently to allow the system to enter the next phase?

Levels of Program Review[1]

During mission conceptualization and requirement generation, an estimate must be made of the importance and urgency of the prospective program and of the costs involved in bringing it to fulfillment. These parameters will determine the level of formal OSD and service management attention. Currently, funding thresholds are set for programs requiring submission of a JMSNS and Secretary of Defense approval at decision milestones, with OSD discretionary authority retained to control less costly, but important or urgent programs. Programs not managed in the "major program" category are managed according to the precepts of the major program acquisition directives, but by service-unique methods.

Department of Defense Directive 5000.1 defines decision milestones for major acquisition programs as shown in Figure 5-1. Procedures are prescribed in Department of Defense Instruction 5000.2 and several other sources. At each milestone I and II, the Defense Systems Acquisition Review Council (DSARC) reviews two documents updated specifically for that milestone: the decision coordinating paper (DCP), and the integrated program summary (IPS). The DSARC's recommendation—proceed/alter/cancel—is forwarded by the Defense Acquisition Executive (DAE) to the Secretary of Defense for approval in the form of a Secretary of Defense Decision Memorandum (SDDM). The latter document provides not only the basic decision but also updates goals and thresholds for the program.

The Deputy Secretary of Defense April 30, 1981 Memorandum "Improving the Acquisition Process" changes the SecDef decision milestones. It " . . . reduces the SecDef decision milestones to two, but ensures full SecDef involvement in major program initiation, and improved program definition for program go-ahead. The first decision point, "Requirements Validation: (equivalent to combination of Zero and One), serves as full DSARC/SecDef review and approval of major program initiation including threat, weapons, concept, risk and schedule, readiness, and affordability goals. At this point a specific "not-to-exceed" dollar threshold is established which sets the funding to carry the program through Con-

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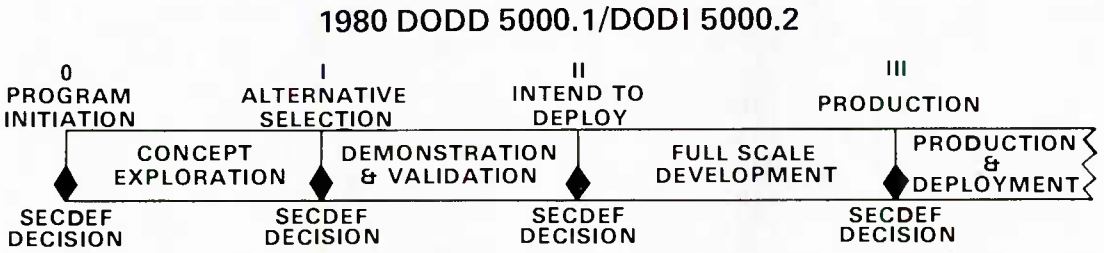
Figure 5-1
DSARC MILESTONES

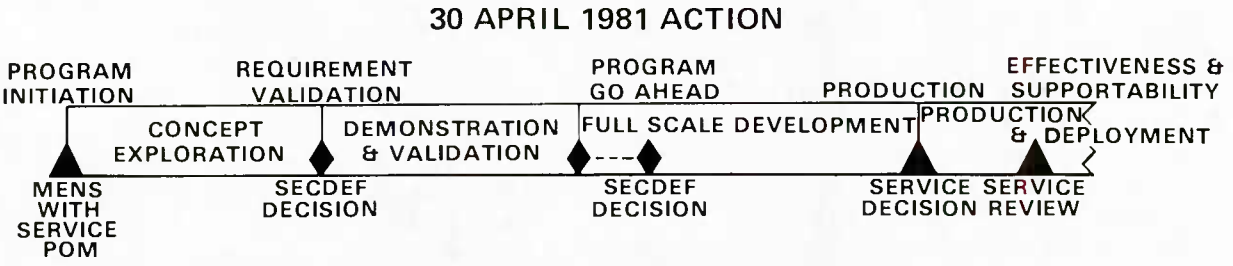
DEFINE—SECDEF conducts a review at specific points in the acquisition process and makes decisions on issues associated with the program.

BACKGROUND — Previously there were four discrete SECDEF decision points.



— Alternatives presented to determine the number of SECDEF reviews.

DESCRIPTION OF INITIATIVE — Decision was made to reduce SECDEF decision milestones to two.



— Requirement Validation Milestone includes:
  — Review and approval of major program initiation including threat, weapons concept, risk and schedule, readiness, and affordability goals.
  — "Not to Exceed" dollar thresholds for program at second SECDEF decision point.
  — Goals to be achieved by, and timing of second SECDEF milestone.
— Program Go Ahead milestone includes:
  — SECDEF review and approval of Service proposed actions to include Full-Scale Development and Production, T&E, Support and Readiness, and total acquisition strategy.
  — Concurrency with Preliminary Design Review.

ADVANTAGES — Reduces administrative burden by fewer OSD reviews.
— Front-end process is speeded.
— Review levels linked to major expenditure increases.
— Program commitment is delayed until program technical, performance, and cost factors are more accurately determined.
— More efficient transition between development and production.
— Services have more responsibility for their own programs.

cept Validation and early Full-Scale Development activity up to the second decision point, "Full-Scale Development and Production." The goals to be achieved by, and the timing of the second SecDef decision point are defined at the first decision point.

The Program Go-Ahead, second SecDef decision point, occurs somewhat later than Milestone II in a "normal" program schedule. The timing of this decision point is flexible, depending on the program's approved acquisition strategy. SecDef retains source veto/disapproval of a Service proposed action and program plans which shall include Full-Scale Development and Production, the program plan for Test and Evaluation, Support and Readiness, and the total acquisition strategy.

Service Secretary if there are no major changes to the program approved at the second decision point by the SecDef.

Each ongoing major program will be reviewed to determine which programs will follow this new sequence of milestones. Currently planned Milestone III programs are being reviewed to determine which reviews should be held at OSD and which should be delegated to the services. Figure 5-1 compares the old and the new milestones.

Whereas Department of Defense Directive 5000.1 and Instruction 5000.2 specify requirements for the services' handling of major acquisition programs, they do not delineate procedures for less-than-major programs. Tables 5-1 through 5-4 summarize the categories, review processes, and authority levels employed by the services for all acquisition programs.

Special Problems of Joint Program Review

Joint programs may present special problems because of the need to satisfy the internal review requirements of all participating services. Each of the services has implemented Department of Defense Instruction 5000.2 differently, as is apparent from examination of their individual DCP processing instructions. One quickly sees that the echelon by which procedures are prescribed is different and that the currency of instruction and level of detail of the relevant documents are also different.

Figures 5-2 through 5-5 display the hurdles major programs must clear within OSD and the individual service staff hierarchies and secretariats. The source for each process is included with the Figure. However, one must recognize that these sterile flow charts do not indicate all the coordination required to bring about a successful milestone review. Nor do these figures suggest internal program management office, program sponsor office, or Office of the Under Secretary of Defense for Research and Engineering action officer staff routines. In fact, more is required of the joint program manager than an understanding of the written procedures alone, for they are often modified. Usually the key individual in a review process is also the key person in changing written requirements. His own staff organization may already be integrating draft directive requirements, an oral requirement, and a DOD or service agency requirement which may take months to be incorporated into print. For example, 9 months elapsed between the promulgation of Office of Management and Budget (OMB) Circular A-109 and publication of the implementing DOD directives. It was not until 22 months after the promulgation of Department of Defense Directive 5000.1 (March 1980) that all the services had officially implemented the new requirements.

Congressional staffs, the OMB and the Defense Acquisition Executive are aware of—or, indeed, have made—certain new requirements to the DSARC process. In the 4 plus years that have elapsed since the initial promulgation of Department of Defense Directive 5000.1 and Instruction 5000.2, new policies have been developed and integrated into the program review process. Among these is a new requirement that the DCP include an annex which addresses the program from the standpoint of NATO Rationalization, Standardization and Interoperability (RSI). In some cases, programs have successfully completed a number of service review steps, only to require the time-consuming re-analysis of the Project Management Plan (or Joint Development Plan) against the complex, and often not very well understood, RSI requirements.[2]

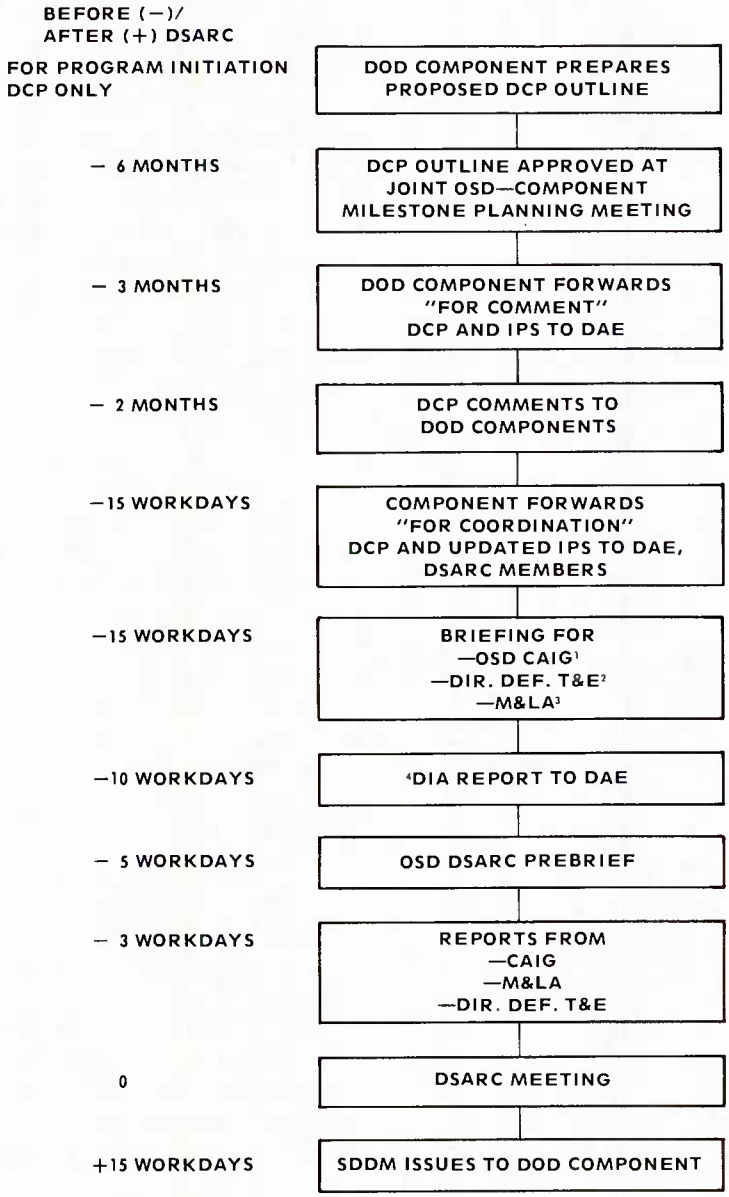
Although burdened with parallel or overlapping review requirements, a joint program manager still has more assistance available to him than the single-service program manager. He should realize that the service staffs and OSD not only need information, but can provide it as well. A free flow of information will be mutually supportive, and the following offices are likely participants in any such exchange:

Army: The appropriate Department of the Army System Coordinator (DASC) in the Office of the Deputy Chief of Staff for Research, Development and Acquisition (DCSRDA). (Code: DAMA-)

Navy: The appropriate Deputy Chief of Naval Operations (DCNO) or Director who is the program sponsor:

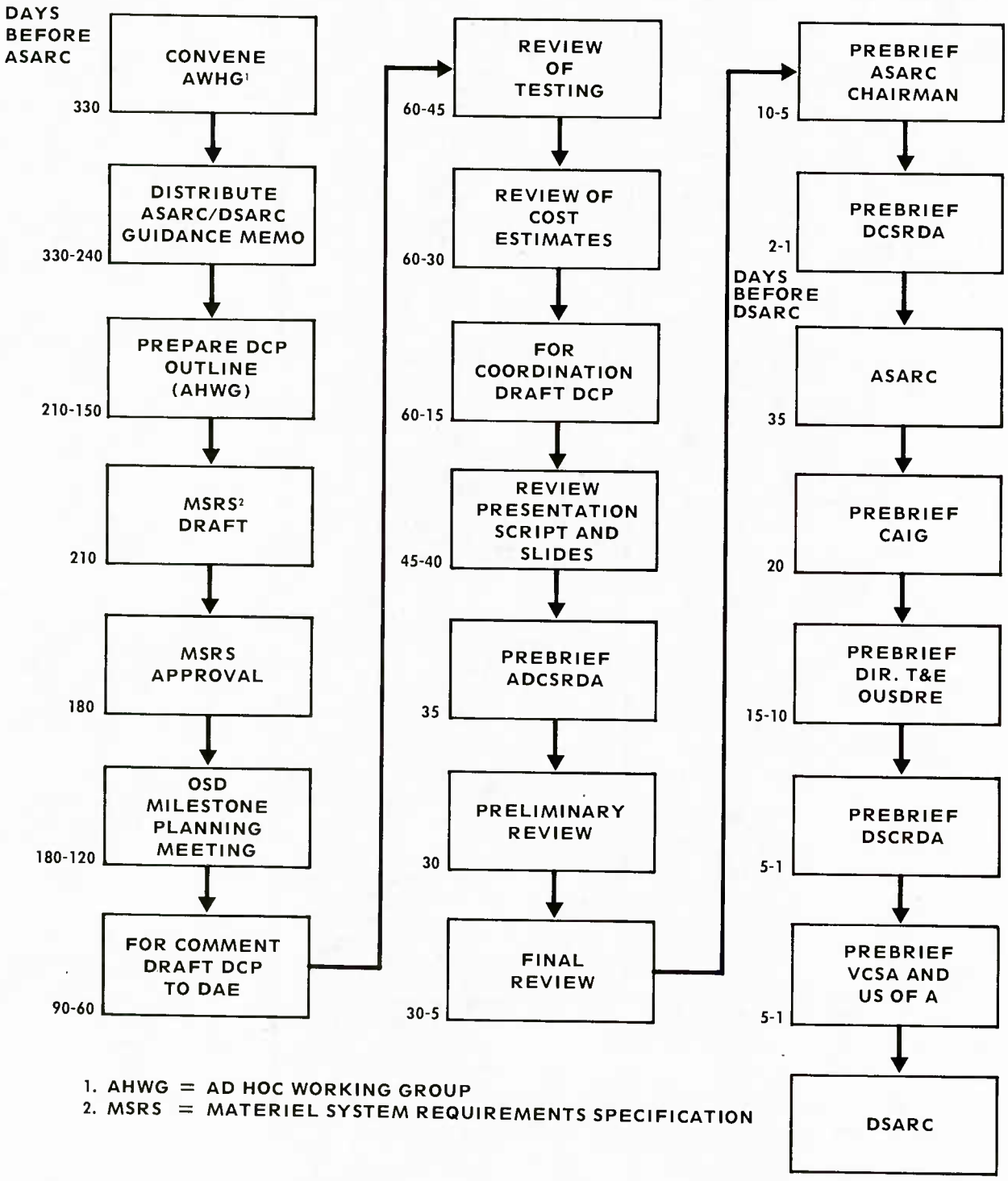
OP-02	Submarine Warfare
OP-03	Surface Warfare
OP-05	Air Warfare
OP-094	Command and Control
OP-095	Naval Warfare

Figure 5-2
DCP PROCESSING: DOD INSTRUCTION 5000.2[5]



(1.) CAIG—COST ANALYSIS IMPROVEMENT GROUP
(2.) DIR. DEF. T&E—DIRECTOR OF DEFENSE TEST AND EVALUATION
(3.) M&LA—MANPOWER & LOGISTICS ANALYSIS
(4.) DIA—DEFENSE INTELLIGENCE AGENCY
(5.) AS OF 1 DECEMBER 1981

Figure 5-3
ARMY DCP PROCESSING: ODCSRDA REG. 15-14



1. AHWG = AD HOC WORKING GROUP
2. MSRS = MATERIEL SYSTEM REQUIREMENTS SPECIFICATION

Figure 5-4
NAVY DCP AND DSARC REVIEW PROCESS: OPNAVINST 5000.46

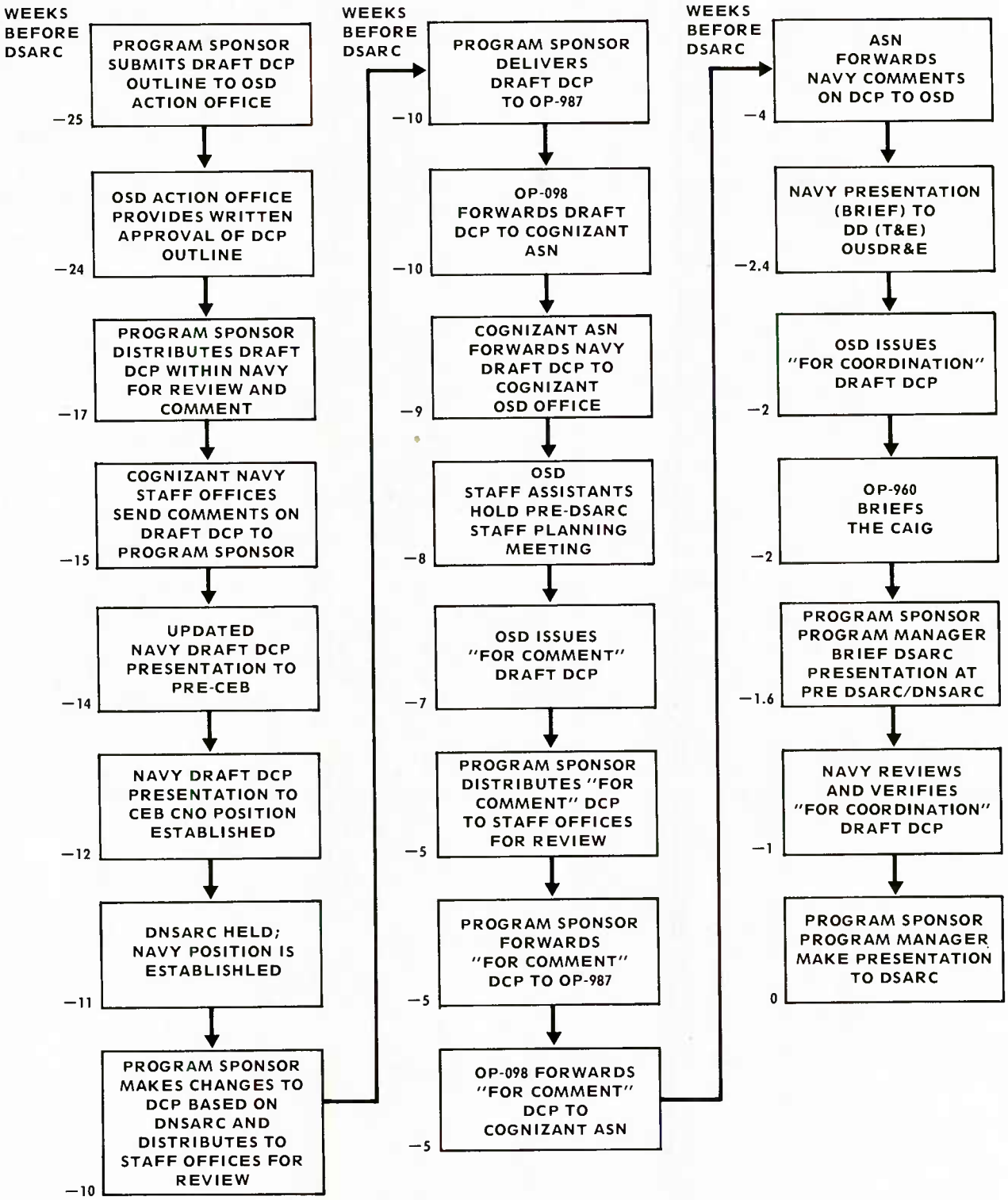


Figure 5-5
AIR FORCE DCP PROCESSING: DRAFT AIR FORCE HOI—PROCEDURES FOR AFSARC

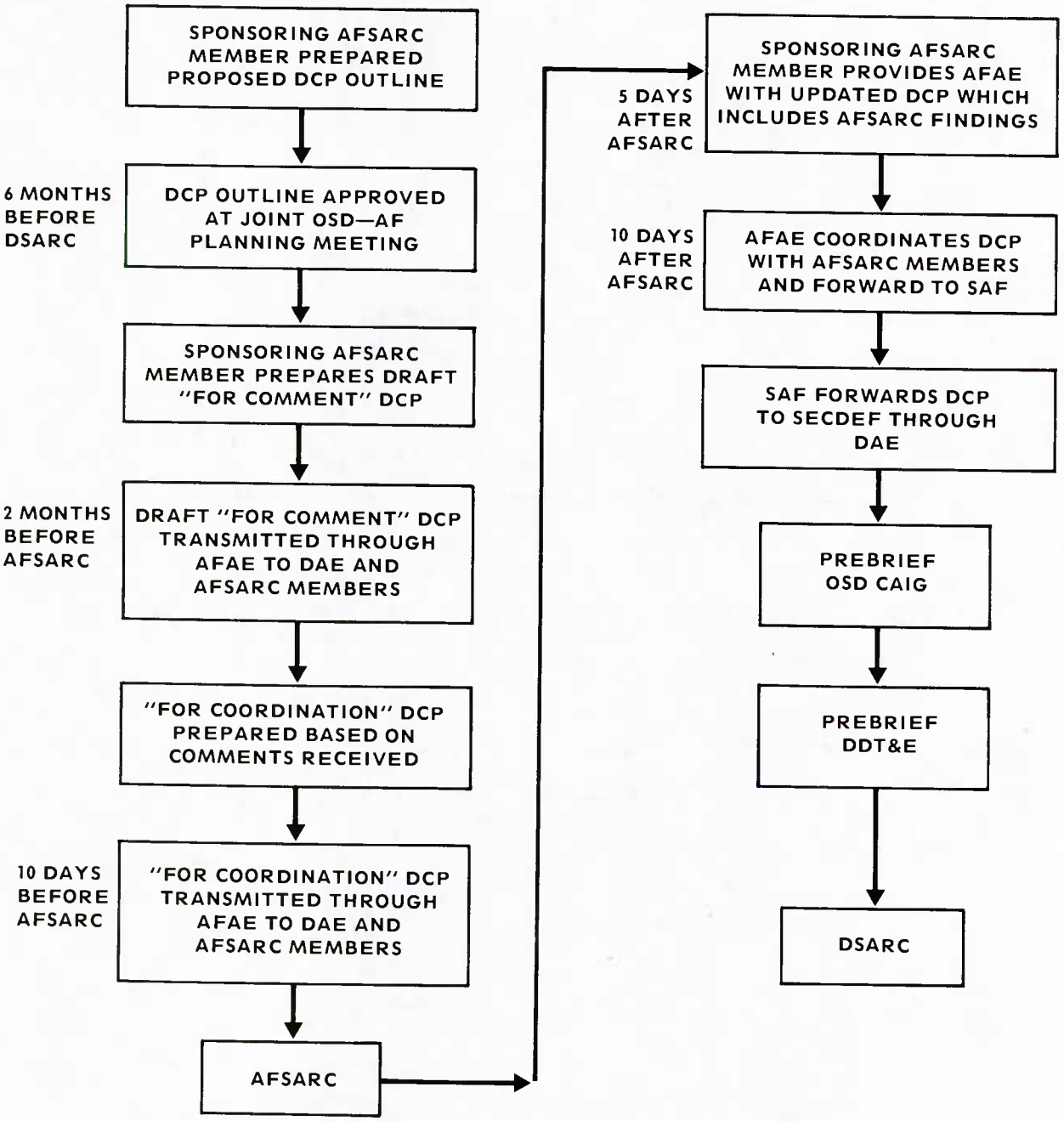


Table 5-1
ARMY PROGRAM REVIEW BY ACQUISITION CATEGORY

TYPE OF ACQUISITION	PRIMARY CRITERIA	LEVEL OF APPROVAL	TYPE OF REVIEW	DECISION RECORDING DOCUMENT
DOD-designated Major Program	Program of significant interest, importance, or impact. Threshold $200M RDTE or $1 B procurement costs.	SECDEF	DSARC ASARC	SCP
Army-designated Major Program Category 1	As directed by ASARC Chairman but not DOD-designated major program.	Secretary of Army	ASARC	Army Program Memorandum (APM)
Non-Major Program Category 2	As directed by DSCRDA.	HQDA (DCSRDA)	In Process Review (IPR)	Acquisition Plan (AP)
Non-Major Program Category 3	$0-75M RDTE and $0-300M procurement costs.	DARCOM	IPR	AP
Non-Major Program Category 4	None of the above.	System R&D Command	IPR	AP

Table 5-2
NAVY PROGRAM REVIEW BY ACQUISITION CATEGORY

	ACAT 1	2S	2C	3	4
Decision Authority	SECDEF	SECNAV	CNO	DCNO/DMSO	CNM (or designee)
Decision Forum	DSARC	DNSARC	CEB or ARC	Sponsor Review	ARB or other NMC Review
ACAT Criteria	$200M R&D or $1B procurement	$100M R&D or $500M Production (under consideration)	CNO discretion	Military characteristics of ship or aircraft significantly affected	
Documentation Required	JMSNS-program initiation SCP-1st milestone DCP/IPS-2nd milestone & TEMP	Mini-NDCP & TEMP	Mini-NDCP & TEMP	TEMP (& mini-NDCP if needed)	As prescribed by CNM (usually mini-NDCP)
Milestone Review • Initiation	SECNAV	SECNAV	CNO	CNO sponsor	CNO sponsor
• Milestone 1	SECDEF	SECNAV	CNO	Sponsor	CNM (or designee)
• Start of FSED if not concurrent with Milestone 2	SECNAV				
• Milestone 2	SECDEF	SECNAV	CNO	Sponsor	CNM (or designee)
• Milestone 3	SECNAV	SECNAV	CNO	Sponsor	

Table 5-3
AIR FORCE PROGRAM REVIEW BY ACQUISITION CATEGORY

TYPE OF ACQUISITION	PRIMARY CRITERIA	LEVEL OF APPROVAL	TYPE OF REVIEW	DECISION RECORDING DOCUMENT
DOD-designated Major Program	SECDEF-designated. $200M RDTE or $1B procurement costs.	SECDEF	DSARC AFSARC	SCP
Air Force-designated Major Program	SEC Air Force-designated	SECAF	AFSARC	AF DCP
Non-Major Program	None of the above			See NOTE below.

NOTE: In addition to the program milestone reviews for DSARC/AFSARC level programs, and solely for programs whose interest or priority is insufficient to warrant DSARC/AFSARC attention, the Air Force employs periodic (vice program milestone) reviews, at which the PM/SPO or the AFSC Systems Officer presents the status of programs as follows:

—Highest Level:	SECAF Program Review (SPR)
	Program Assessment Review (PAR) by Air Staff
—AFSC Level:	Command Assessment Review (CAR)
—Product Division Level	Management Assessment Review (MAR) (generally less than $2M to achieve program objectives)

In general, SPR/PARs, CARs, and MARs are held quarterly, with monthly updates to the SPR/PAR, CAR, MAR document. The level at which a program will be reviewed is more discretionary than cost-influenced.

Table 5-4
MARINE CORPS PROGRAM REVIEW BY ACQUISITION CATEGORY

TYPE OF ACQUISITION	PRIMARY CRITERIA	LEVEL OF APPROVAL	TYPE OF REVIEW	DECISION RECORDING DOCUMENT
DOD-designated Major Program	SECNAV-designated. $200M RDTE or $1B procurement costs.	SECDEF	DSARC	SCP
Navy-designated Major Program	SECNAV-designated $75M RDTE or $300M procurement costs	SECNAV	DNSARC	Navy (NDCP)
Marine Corps-designated Major Program	CMC-designated. $5M RDTE or $20M procurement costs.	CMC	MSARC	Acquisition Decision Memorandum (ADM)
Marine Corps Non-Major Program	None of the above.	Chief of Staff (MCHQ)	In Process Review	ADM

Marine Corps: The appropriate Development Program Officer (DPO) in the Office of the Deputy Chief of Staff for Research, Development, and Studies (MC-RD).
Air Force: The appropriate program element monitor (PEM) in the Office of the Deputy Chief of Staff, Research Development and Acquisition (AF/RD) or Deputy Chief of Staff, Logistics and Engineering (AF/LE).
Department of Defense: The appropriate action officer in the Office of the Under Secretary of Defense for Research and Engineering.

DASCs, program sponsors, DPOs, PEMs and action officers may have several projects to monitor, or only one. Army DASCs and Air Force PEMs are likely to have a single program. The Navy program sponsor, the Marine Corps (DPO), and the USDRE action officers are likely to monitor many projects in their specific warfare disciplines. Consequently, more initiative is required to coordinate with these Navy, Marine Corps and USDR&E points of contact.

The joint program manager's relationships with these monitors should be as open as possible. They are often called upon to make planning, programming or resource allocation recommendations to service secretariat or OSD decision-makers. While the program manager is concerned about trade-offs among the competing demands of system performance, cost, and schedule, they are answering queries and providing information and recommendations that can enhance or undo the program acquisition strategy. Prompt responses to their requests for information will make successful accomplishment of the program reviews much easier.

Furthermore, the Pentagon monitors associated with the incipient joint program are likely to be much more knowledgeable about the various service-OSD interfaces than the program manager. Many of them will have processed MENS, DCPs, and SDDMs. Some will have experience with the incumbent principal decision-makers. They will be the sources of the understanding of the details behind the generalized DOD acquisition documents and of the areas where promulgated directives are no longer current. Some will have a detailed internal staff instruction which provides for check points and guidance during the review process. One of them may be drafting a revision to a significant directive which, though not yet promulgated, comprises a much more up-to-date document than the official one. (There probably will always be a draft Department of Defense Directive 5000.1 or Instruction 5000.2 in circulation "for comment" or "for coordination.") The new joint program manager can receive the benefit of this "insider" knowledge only through having built a cooperative relationship with these most important people.

To sum up, the joint program manager should do his homework and establish good working relationships with his Pentagon monitors so he can use the joint review process to gain support for his program.

Footnotes

1. Shortly before the Joint Commander signed this guide, the Deputy Secretary of Defense, Frank C. Carlucci signed DOD Directive 5000.1 on 29 March 1982. Also, on 12 April 1982, the Under Secretary of Defense, Research and Engineering, Richard D. DeLauer, promulgated by memorandum major defense system acquisition program documentation format. Because of the close proximity of these events, the policy and requirements of these documents may not be fully included in this guide. Accordingly, the reader should seek additional guidance from these source documents.
2. DSMC has prepared a NATO/RSI Guide.

CHAPTER 6
Organization and Staffing

Program Structure

There is no standard for joint programs. The program structure depends on the size and goals of the program, the phase of the program in the acquisition process, the desired relationship among the services, the acquisition strategy for the program, and the role of OSD in the program. There is a wide variety of joint program organizations. The joint program manager must tailor his organization to the mission, functional relationships with the executive and participating services, and extent of responsibilities of the joint program office.

Joint programs normally require more personnel than typical single-service programs due to much more coordination and the need for being aware of participating services' efforts, as well as the executive service program efforts requires more diverse skills and specialities resident in the joint program office. Grade structure of the joint program office tends to be higher because of increased responsibilities, and because the tasks require considerable knowledge of how each service operates. This is especially true in the logistics areas, as personnel tend to be specialized and many problems in inter-service logistics are manpower intensive. Current formal and service training is focused toward the parent service and therefore there is a considerable learning time, 6-8 months, before an officer or civilian, knowledgeable in his service, can be effective in representing another service or joint service. Business management requires augmentation to maintain the additional records, prepare the separate briefings and the additional budget exercises required of the other services.

Organization of the Joint Service Program Office

A joint program is usually initiated based upon direction from the Deputy Secretary of the Defense (Dep Sec Def) or Under Secretary of Defense for Research and Engineering (USDR&E) in the form of a memorandum designating a lead or executive service and directing that service to charter the joint program. Normally, the lead or executive service provides the program manager, but recently the Dep Sec Def, in an 8 May 81 memorandum,[1] directed the Army to be "the contracting agency with overall acquisition responsibility" with the USMC to provide at a minimium the program manager. It should be noted that joint service organization involves continuous, dynamic and complex processes with substantial areas for dispute. DOD policies and regulations, including AFLC/AFSC R 800-2/AMRC 70-59/NAVMATINST 5000.10A, provide only the basic framework to resolve interservice issues, usually through compromise and negotiations of the memorandum of agreement (MOA)[2] and its annexes between the services. A listing is provided at Appendix F of current joint service programs.

Single-Service Program Office

Many joint programs, especially small programs, are joint only because their goals are to satisfy joint requirements. For the most part, these programs are structured and managed as they would be if they were single-service programs. The participating service may assign a liaison officer or representative to the program office, or it may simply monitor the program. Normally, the interests of the Executive Service dominate the program.

Jointly Staffed Program Office

The term "joint program" usually conjures up the image of a single, jointly staffed, program office. The Executive Service provides the program manager, most of the program management staff, and administrative support. The participating services each contribute a deputy program manager and other military officers to the program management staff. In practice, most joint programs are not structured this way; there are few jointly staffed program offices. However, the practice is becoming more common and seems to be the joint program structure preferred by the services. Though not explicit about program structure, the Joint Logistics Commanders' Memorandum of Agreement on "Management of Multi-Service Programs/Projects" assumes the creation of a jointly staffed program office, and most programs structured that way follow the guidelines of the MOA.

Multiple Program Offices

A surprising number of joint programs are, in fact, multiple programs or projects whose activities are coordinated. The degree and method of coordination vary from program to program, as does the principal source of program direction. Frequently, the OSD plays some direct role in the program's execution.

As one might suspect, many joint programs in this category have unique management structures. Several examples of these structures are depicted in Figure 6-1. The structure shown in Figure 6-1a might be considered more a confederation of program's than a joint program. Each service manages its own program but exchanges information regularly with the other services. OSD sometimes orchestrates the efforts, dividing responsibilities among the services to eliminate duplication or to ensure that alternatives are explored. OSD direction and inter-service interactions are minimal.

The opposite is true of the joint program structure depicted in Figure 6-1b. In it, a jointly staffed OSD program office has been created. Subordinate project offices are staffed and administratively supported by the services. Program direction is provided by OSD.

Figure 6-1c shows a program structure which is similar to that in Figure 6-1b. The difference is that instead of creating an OSD program office, one of the services has been tasked to provide overall program management. Individual projects are managed by the services. Central control is less extensive than that exercised by an OSD program office, concentrating primarily on requirements, funding, and configuration.

Figure 6-1d depicts another variation of the structure of Figure 6-1b. Direction to the joint program office is provided by an executive committee comprised of senior representatives from each of the services participating in the program, as well as from OSD. Such an arrangement tends to moderate OSD control of the program, yet still provide strong, central program direction.

Program Office Organization

There are two basic alternatives for program office organization. One is to include on the program management staff all functional specialists needed for program execution, essentially establishing a self-contained organization. The other is to restrict the program management staff to a cadre of managers who draw functional support from the parent organization. This latter is commonly called a matrix organization. Most program management organizations are neither completely self-contained nor completely matrix, but a mixture of the two. Large, high-priority programs, especially in the Air Force and Navy, tend more toward the self-contained program office organization, depending less on small outside matrix resources; low-priority programs tend more toward the matrix type. The joint staff manning effort should include a configuration of agreed-to position types and numbers, their configuration and estimated duration of service. The personnel requirements should be specified as military or civilian and the service providing the resource. Sufficient time must be allowed in filling civilian requirements.

Joint programs normally follow the organization practice of the Executive Service. However, in a jointly staffed program office, it is normally desirable to include on the program management staff as much functional expertise as practicable. Supporting a joint program that has the active participation of two or more services is an extraordinary task. It is time consuming. Many of the services' normal procedures must be modified or abandoned in favor of procedures better suited to the program's needs. A functional specialist who is assigned full-time to the program management staff is more likely to share fully in the spirit and objectives of the program and to cling less fervently to service-peculiar procedures than is one who is working part-time for the program.

A complicating factor in the organization of a jointly staffed program office is the assignment of responsibilities to personnel from the participating services. The fact that the program office is jointly staffed is evident of the participating services' desires to influence the program. However, it should be clear from the organization of the program office, as well as stated in the charter, that the participating services' representatives share responsibility for success of the joint program, they are not merely representing their services' interests. To accomplish this, the joint program manager should organize his staff and allocate key positions among the services such that a balance of responsibility, authority, and influence is maintained. The senior representatives from the participating services must be in the chain-of-command, directly subordinate to the program manager. Sometimes this may require creating one or more positions for principal deputy program managers. Creating extra positions is preferable to rotating one position among the participating services or to slighting the interests of one by subordinating its representative to the other services'.

Figure 6-1
STRUCTURES OF JOINT PROGRAMS HAVING MULTIPLE PROGRAM OFFICES

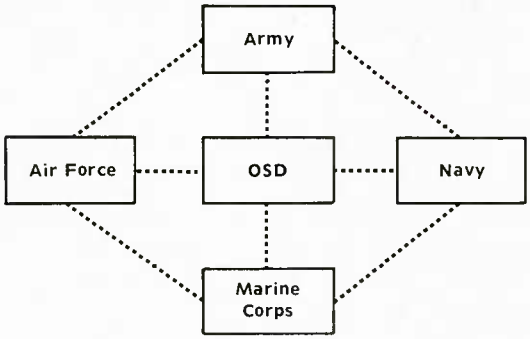


Figure 6-1a

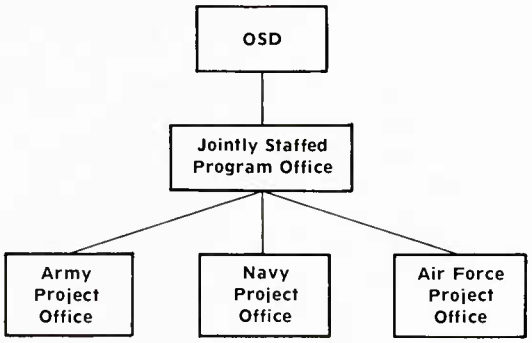


Figure 6-1b

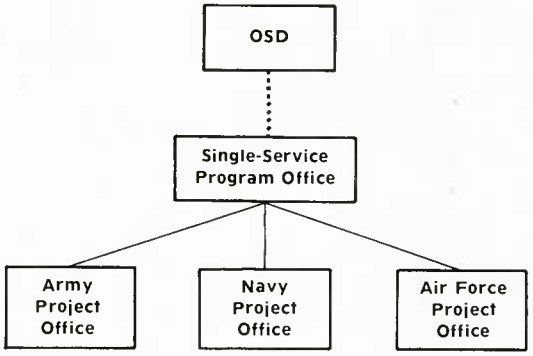


Figure 6-1c

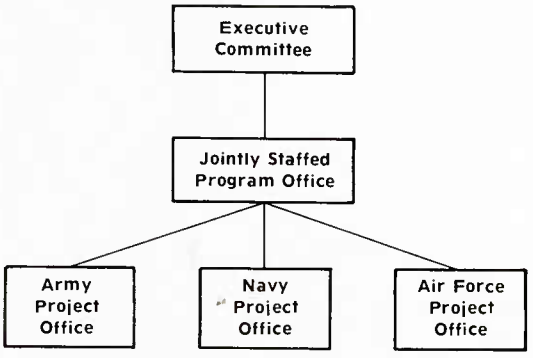


Figure 6-1d

Personnel Selection

One of the joint program manager's greatest challenges is creating an *esprit de corps* within the program office. There are bound to arise situations in which the services' interests conflict. Success of the program then depends on having program management staff personnel who are committed to resolving the problem, rather than provoking confrontations. Representatives from the participating services must be expected to guard their services' interests; that is why they are assigned to the program office. But their attitude and approach must be dedicated to success of the program.

The joint program manager wants on his staff the same type people who are wanted on every staff: knowledgeable, hard-working, efficient, and loyal. More than others, however, the joint program manager needs people who can work well with others and who are willing to explore unique solutions to management problems. The joint program staff must be creative, flexible, and determined.

Selection of the deputy program managers, especially those from the participating services, is particularly important to the joint program manager. Not only must he have confidence in the abilities of his deputies, he must be able to develop a good working relationship with them. Personality conflicts, even among people who are otherwise competent, can undermine a joint program. Before accepting assignment of key personnel, the program manager should interview them, discuss program objectives, management approach, and management philosophy, and satisfy himself that each will become a part of a good management team.

Personnel Evaluations

As a general rule, each person's performance should be evaluated by his supervisor. In joint programs, this rule can be followed for most personnel. The common exception is for military officers assigned by a participating service to a jointly staffed program office. It is normally considered important to an

officer's career for his performance to be evaluated by an officer of his own service. Therefore, in a jointly staffed program office, the participating services' senior representatives should be responsible for evaluating the performances of officers from their services.

The program manager, however, should always evaluate the performances of the participating services' senior representatives, even if they are evaluated also by the participating services.

Footnotes

1. Deputy Secretary of Defense Memorandum, Subj: Mission Element Needs Statement (MENS) for the Light Armored Vehicle (LAV), dated 8 May 1981.

2. Previously DOD Directive 5000.1 did not address Joint Service Program Management. This void necessitated the Joint Logistics Commanders memorandum of agreement which was subsequently promulgated as a joint regulation (Joint Air Force Systems Command/Air Force Logistics Command/Army Materiel Command/Naval Material Command Regulation, "Management of Multi-Service Systems/Projects/Programs," AFSC/AFLC R 800-2, AMC R 70-59/NAVMATINST 5000.10A). The 29 March 1982 issue of DOD Directive 5000.1 on Major Systems Acquisition does include policy direction on Joint/Multi-Service Program Management. Because of this, the Service regulations cited above are being reviewed for possible cancellation, but procedural guidance is included herein.

References

1. John S. W. Fargher, Jr., "An Analysis of Joint Service Acquisition Programs," *Ninth Annual DOD/FAI Acquisition Research Symposium Transactions*, June 9-11, 1980, (Office of Naval Research, Arlington, Va.), pp. 1-3 to 1-9.

2. Colonel Norman A. McDaniel, USAF, and Lieutenant Colonel Dino A. Lorenzini, USAF, "An Analysis of Joint Service Acquisition Programs," Report of the Naval War College Center for Advanced Research, (Newport, RI: Naval War College, June 1979).

CHAPTER 7
Financial Management

Establishing A Sound Financial (Business) Base.

Selection and assignment of an experienced and knowledgeable Financial Manager is essential to establishment of a sound financial base for a Joint Service Program. Regardless of the official title—Fiscal Manager, Controller, Financial Manager or Business Manager—the financial management responsibilities are the same. They are pervasive, encompassing planning and control of all financial matters relating to programming, budgeting, allocating, committing, obligating, expending and accounting of funds for salaries, for example, as well as actual equipment or system development. The financial manager must be on board and deeply involved in financial analysis and planning needed to establish program cost estimates, and be the principal architect on preparing the Joint Program Funding Plan. The funding plan should be keyed to the work breakdown structure and master schedule prepared by program analysts with the assistance of cost analysis experts, and must include a time-phased profile of funding requirements by type and source. The plan must lend itself to ease of breakout of funds by source—particularly the "other" services planned contribution of funds, by type. Selection and assignment of a competent financial manager and development of a comprehensive funding plan are key—first—steps in establishing a sound business base for the Joint Service Program. Accordingly, the first critical task that must be accomplished by the financial or business manager is development of the funding plan.

A second critical task will be to establish central control of all funds allocated to the program, regardless of source, purpose or ultimate approved use. All obligational authority for the Joint Service Program should be transferred to the Joint Program Office or that office's present development/logistics command, even if some obligational authority is returned to the participating services. The Joint Program Office should use the financial management and accounting procedures of the Executive Service.

Programming and budgeting activities also should be centrally directed by the Joint Program Manager. Although the programming and budgeting processes in all the services follow the same general pattern and schedule established by the Office of the Secretary of Defense (OSD), practices do vary from service to service. Moreover specific practices are likely to vary from year to year within any service. The Joint Program Manager or his financial manager are not advised to attempt to become expert in the service-to-service variations. Where possible, and certainly in the case of a large program office staff, financial experts from each of the participating services should be included. When staffing authorizations or lack of available personnel preclude such staffing, the financial manager must establish and exercise close coordination with, and obtain timely assistance of controller and Headquarters Staff personnel in the participating services. Specific points of contact must be established and working relationships cultivated to ensure quick and decisive responses to financial management matters. Just as important is the matter of the Joint Program Office keeping the participating services informed (up-to-date) on financial status—relating to allocation commitment and obligation of funds. In any event, the Financial Manager should ensure that program and budget submissions are compatible with the master schedule and joint program funding plan; that these come together at OSD as a joint funding requirement, and are defensed before OSD, OMB and Congress as a joint program.

Sharing of Funding Responsibility

Few joint programs enjoy single-source funding. Funding responsibility for most joint programs is shared by the Executive and Participating Services. Whereas joint program direction often emanates from OSD, funding is provided by the services, subject to each service's assessment of its own funding priorities.

The funding arrangements for a joint program are normally defined in the program charter or in a memorandum of agreement (MOA) between the services. If neither of these is possible, the funding arrangements should be defined in MOA between the joint program manager and each of the services.

The formula for sharing funding responsibility varies from program to program. Here is a typical arrangement:

Research, Development, Test and Evaluation Funds. Requirements peculiar to one service are funded by the sponsoring service. Funding of requirements common to all participants is either provided entirely by the Executive Service or split among participants according to an agreed formula (e.g., proration according to planned procurement).

Procurement Funds. Each service provides funds to meet its own requirements. Funding of common items, such as data and software, is prorated among participants.

Operation and Maintenance Funds. Although Operation and Maintenance (O&M) funded activities, such as repair, rework, modification, etc., of the deployed system, may not occur until after the disestablishment of the joint acquisition program office, the joint program funding plan must make provision for such O&M expenditures. In this case, a formula for proration of the costs among deploying services should be planned.

Military Personnel Funds. Each service bears all costs of its military personnel assigned to the joint program office.

Military Construction Program (MCP) Funds. A problem common to many complex interservice programs is lack of adequate planning for MCP funds for R&D and operational deployment facilities. Generally, all construction in excess of $100K per facility must be funded from MCP funds. The normal lead time for programming of these funds is 3 years before the facility is needed; some facilities, such as those supporting some types of new ammunition, may require up to 7 years. Adequate advance planning, especially for unique facilities, can eliminate potential program schedule impacts during full-scale development.

Avoiding Funding Problems

To minimize the possibility that one service may back out of the joint program (most likely when the system is ready for production, because that is when large sums are committed), the program manager should periodically verify that the users' needs remain as stated for the program. If the user interest is weak, chances are the service will never support production. To get a clear indication of user interest, it is important to press for inclusion of procurement funds in the outyears of the Five Year Defense Plan (FYDP).

Even when firm user needs exist, there is always the possibility that one of the participants may unilaterally eliminate or reduce its number of production units, thereby increasing unit price to the other participants. There is no universal solution to this problem. However, one joint program manager was able to avoid the problem by negotiating a joint program procurement commitment. The commitment obligated each participant to procure a specified minimum quantity or pay the increase in unit procurement costs suffered by the other participants because of reductions in the total quantity of units procured.

An arrangement similar to a procurement commitment can also be used to resolve funding problems arising from engineering changes made during production. During development, funding of changes usually follows the pattern established for funding of total program research and development. Changes to meet requirements peculiar to one service are funded by the service sponsoring the change. Other changes are funded either by the Executive Service or on a pro-rata basis. Whether a change should be common or service-peculiar is frequently the subject of heated debate, but once that issue is settled, the funding responsibility is clear. Engineering changes made during production are likely to pose a more difficult problem, since changes invariably increase unit price and, by then, the services have already established their total affordable production requirements. If one participant does not want the change and cannot afford the increase in unit price, the program may be torn between foregoing the change for all parties (perhaps resulting in a product which is unacceptable to one service) or abandoning the common configuration. One joint program manager solved such a problem by persuading the participant needing the change to fund the increase in unit price to the others, thereby incorporating the change and maintaining a common configuration at no additional cost to those not needing the change.

Other problems in joint program funding frequently arise from differences among the services in their uses of various categories of funds or in funding responsibilities within a service. There is no catalogue of such differences among the services, however a few examples should be adequate to illustrate the types of variation which might be encountered. Most of the examples concern development or procurement of support items, hence the deputy program manager for logistics should have a keen interest in them. For example,

- The Army frequently buys reprocurement data with development funds, whereas the Air Force normally buys reprocurement data with production funds.
- The development and procurement of technical orders and technical manuals are normally funded entirely with procurement funds by the

Navy, but separately by development and procurement funds by the Air Force.
- In the Army, the development, testing, and procurement of support items are normally accomplished concurrently with development, testing, and procurement of the primary system. Another service may prefer that development, testing, and procurement of support be delayed and much of the initial support be provided by contractors.
- In the Army and Navy, all funding for development and procurement of a new system and its support requirements is provided by the materiel developer, the Department of the Army Materiel Development and Readiness Command or the Naval Material Command. In the Air Force, funding responsibility is split between the Air Force Systems Command, the materiel developer, and the Air Force Logistics Command, which funds procurement of most system support, such as initial spares, depot facilities, and initial contractor support.

The lesson to be learned from these illustrations is to list, early in the program, all items to be developed and procured and to review the list in detail with the comptrollers or other knowledgeable financial managers in each participating service. Every effort should be made to ensure that variations among the services in funding practices for each item are well understood and that the joint program funding plan reflects these funding differences.

Relationships Outside the Program Office

Joint program managers learn soon after assuming office that certain individuals outside their program offices can expedite or impede their progress and that good working relationships with such individuals should be established at the outset. Among these people are the service comptrollers, at both headquarters and systems command levels. For instance, it is often the comptroller of the systems command providing support to the program office (e.g., Naval Sea Systems Command) who issues the budget call and the call for the annual program objective memorandum (POM) to which the joint program manager must provide inputs.

Most program managers have found it advisable to have frequent contact with the comptroller and, at all times, to be as forthright as possible in their relationship. For instance, if the program manager foresees a circumstance arising which might prevent him from obligating funds as planned, it might be well to so advise the comptroller. This is good insurance, for at some later date the program manager may have a genuine need for funds which he does not have. He is much more likely to get a sympathetic hearing from the comptroller if he has cooperated in the past.

Other individuals outside the program office who can be of great help to the program manager are the action officers on the service headquarters staffs who monitor acquisition programs. (The titles and roles of these staff coordinators are discussed in Chapter 5. "Program Review.") In matters of planning, programming, budgeting, and program review, the staff action officers can be instrumental in ensuring that the program's interests are well presented and that the services' internal administrative requirements are met in a timely manner.

Cost Estimating

There is very little unique about estimating the costs of a joint program. Both the cost estimating requirements and the methodologies available for satisfying the requirements are the same as those for single-service programs. The procedures of the Executive Service should suffice, except for estimating the support investment and operating and support portions of life cycle costs.

The services operate in different environments, are organized to accomplish different missions, and support their forces differently. The implication of these differences is that support concepts and requirements for logistic resources vary from service to service, even when all the services are operating the same type of equipment. Estimates of support investment and operating and support costs must reflect those variations. For example, the equations used to estimate the cost of spare parts for an avionics equipment on an Air Force tactical fighter might include a war reserve spares kit (WRSK) to permit squadron level support of the system during the first 30 days of a deployment, however the equations used to compute the cost of spare parts for an identical equipment on a Navy fighter might include requirements to support a 60-day, aircraft carrier deployment. The cost-estimating technique used by the joint program must be tailored to satisfy both requirements.

A useful approach to identifying fundamental differences between the support requirements of one service and those of another is to write a system program definition statement (SPDS). This statement outlines, for each service, the basic assumptions which must be made, implicitly or explicitly, in any estimate of support investment and operating and support costs. The following elements should be included:

—mission profile

—system characteristics (e.g., configuration and crew requirements)

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—acquisition program (e.g., delivery schedule for deployed, training, pipeline, and attrition systems)
—deployment concept (e.g., basing plan and operating schedule)
—support concept
—logistic goals (e.g., reliability and maintainability)
—logistics funding plan

Researching and developing the SPDS provides valuable insight into how each of the services plans to use and support the new system. Once completed, the SPDS provides a sound basis for the cost estimates. The next step is to select the cost estimating models.

Although there are some standard, or at least frequently referenced, life cycle cost models available in the DOD, most acquisition programs either develop their own or adapt existing models to their needs. Frequently, more than one model is needed to make a good assessment of program costs. The best source of information about models and the peculiar analysis requirements associated with a type of equipment is the integrated logistic support organization within the service's systems or commodity command. For example, information about estimating the costs of ground electronics equipment, assistance may be found in the Army Communications Electronics Command, the Naval Electronic Systems Command, or the Air Force Acquisition Logistics Division, Air Force Logistics Command.

Program analysts, cost analysts, as well as the financial manager, must understand cost data or ensure availability of experts from participating services when defending programs before OSD, OMB, and Congress. The Army has recently published a Handbook (DCP-P-58), Understanding Cost Data, February 1981 indicating that staff members may find the handbook useful when "about to testify on the hill." The Joint Program Ofice should seek out similar information from participating services if it is not covered below. Here are the contents of DCA-P-58 (The definition of terms has been established in DODI 5000.33 with Army implementation by AR 11-18):

Understanding Cost Data

This section is designed to provide a better understanding of key cost terms, how they are related, and how they can be used more precisely. It also provides reference lists of unit costs for selected systems.

Summary

Figure 7-1—Materiel Systems Cost Terms. Eight definitions from AR-11-18, The Cost Analysis Program, are restated in layman's terms. This regulation implements and expands upon DODI 5000.33, Uniform Budget/Cost Terms and Definitions.

Figure 7-2—Relationships of Key Cost Terms. The same eight cost terms identified in Figure 1 are shown in their relationship to each other and to the primary phases in the life cycle of a system. Procurement cost and its components should be studied carefully as this is the area that is most misunderstood.

Figure 7-3—Relationship Between Life Cycle Phase and Appropriations. This matrix is drawn from cost data of several systems. It shows that costs associated with any phase of a system's life cycle can be composed of multiple appropriations.

Figure 7-4—Use of Cost Terms in Primary Source Documents. Primary source documents are not consistent in their reference to the cost terms described herein.

Figure 7-5—Specifying Unit Cost. Unit cost data, or cost of a single item, is particularly troublesome because of the many ways in which dollars can be expressed and quantity can be measured. Any statement of unit cost *must* indicate which qualifiers are in use for both dollars and quantity.

Figure 7-6—Procurement Unit Costs for Selected Acquisition Report (SAR) Systems. Costs are given in both constant FY 82 dollars and in current year dollars as contained in SARs. In all cases the period used to derive the unit cost is over the life of the program.

Figure 7-7—XM-1 Unit Cost Summary. An example of hardware through program acquisition costs for an actual system. Follows the format of the unit cost summary contained in Appendix C, AR 11-18.

In addition, the DOD Cost Analysis Improvement Group and each of the services has published policy or guidance on life cycle cost management. The following are the primary references:

—Office of the Secretary of Defense, Cost Analysis Improvement Group, *Aircraft Operating and Support Cost Development Guide*, 15 April 1980.

Department of Army Pamphlets

No. 11-2 *Research and Development Cost Guide for Army Materiel Systems*

No. 11-3 *Investment Cost Guide for Army Materiel Systems*

No. 11-4 *Operating and Support Cost guide for Army Materiel Systems*

No. 11-5 *Standards for Presentation and Documentation of Life Cycle Cost Estimates for Army Materiel Systems*

—Secretary of the Navy Instruction, SECNAVINST 4000.31, *Life Cycle Costing*

—Air Force Regulation, AFR 800-11, *Life Cycle Cost Management*

Figure 7-1
MATERIAL SYSTEMS COST TERMS

Explanation, in layman's terms, of cost definitions contained in AR 11-18, The Cost Analysis Program. ALL TERMS EXCEPT HARDWARE COSTS ARE AUTHORIZED BY DODI 5000.33, UNIFORM BUDGET/COST TERMS AND DEFINITIONS.

1. HARDWARE COST Includes only production costs to bring a major end items out of a manufacturer's plant.

   Used in the Army for Trade-off analysis, Configuration control,

2. FLYAWAY, ROLLAWAY COST All production costs to enable production and management of a major end item.

   Used by OSD for internal management, Design-To-Cost (DTC)

3. WEAPON (MATERIEL) SYSTEM COST Flyaway costs plus additional major end item costs (new equipment training; operation, maintenance, and training manuals; technical and managerial data; and peculiar support equipment).

   Used in Congressional Data Sheets (P.L. requirement).

4. PROCUREMENT COSTS Adds initial provisioning of spares and repair parts to Weapon System Cost.

   Used in Congressional Data Sheets, President's Budget (may be in separate lines), and SARs.

5. DEVELOPMENT COSTS All costs of research and development from the time the program/system is designated by title as a Program Element or major project in a Project Element.

   Used in PPBS, Congressional Descriptive Summaries and Data Sheets, and as part of Program Acquisition Costs.

6. PROGRAM ACQUISITION COSTS Includes the costs of research and development, associated military construction, and the Procurement Costs thus capturing all the costs necessary to place a new materiel system in the field.

   Used in Congressional Data Sheets, SARs and OSD Cost Analysis Improvement Group (CAIG) deliberations.

7. OWNERSHIP COSTS All costs associated with operation and supporting fielded equipment

   Used by management in planning and programming, trade-off analyses

8. LIFE-CYCLE COSTS The total costs to the Government for a system over its full life including all of the above and, where applicable, disposal costs.

   Used by management in Planning, Cost benefit analyses, Affordability assessments.

Figure 7-2
RELATIONSHIPS OF KEY COST TERMS

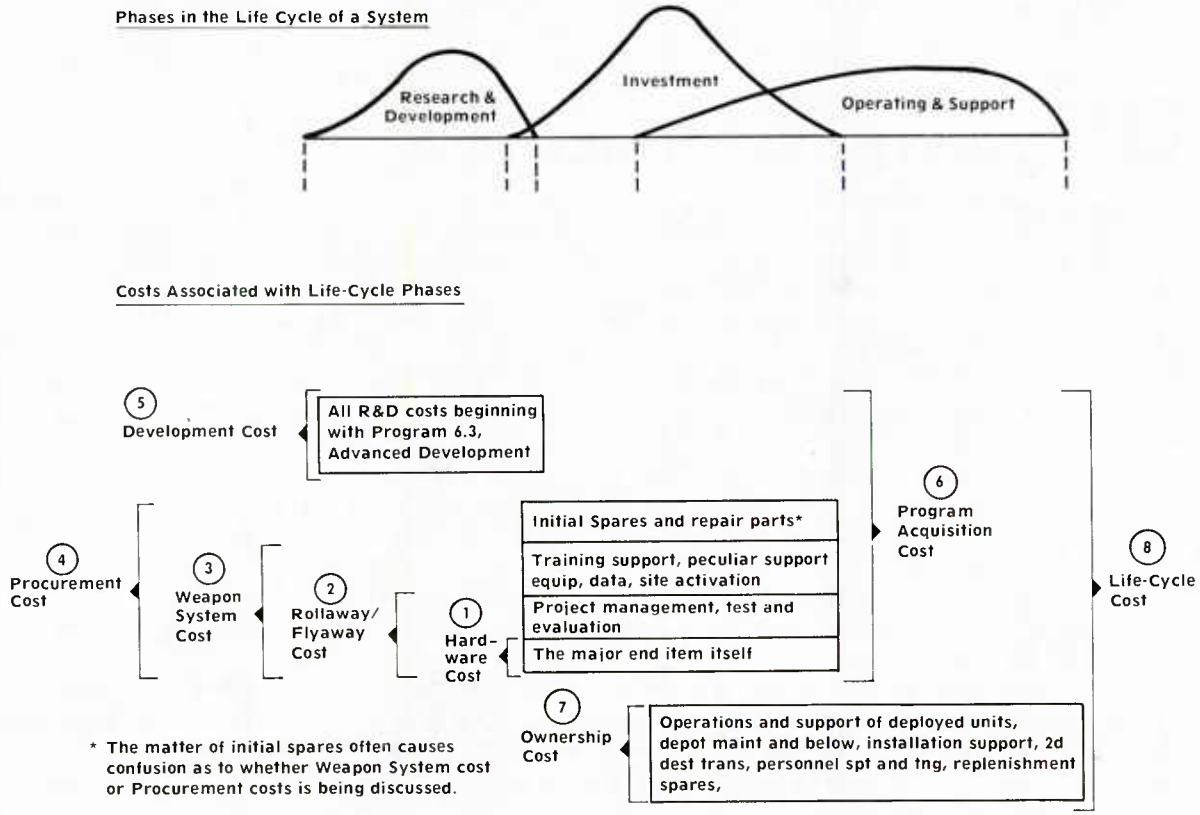

Figure 7-3
RELATIONSHIP BETWEEN LIFE-CYCLE PHASE AND APPROPRIATION

APPROPRIATIONS	LIFE-CYCLE PHASE		
	RESEARCH AND DEVELOPMENT	INVESTMENT	OPERATING AND SUPPORT
RDTE	✓		
PROC		✓	✓
MCA	✓	✓	✓
MPA	✓	✓	✓
OMA	✓	✓	✓

Figure 7-4
USE OF COST TERMS IN PRIMARY SOURCE DOCUMENTS

DOCUMENTS / COST TERMS	FY DP PROCUREMENT ANNEX	P1	PROCUREMENT CONGRESSIONAL DATA SHEETS	BUDGET GREEN BOOK	SELECTED ACQUISITION REPORTS	KEY DOCUMENTS OF THE ANALYTICAL COMMUNITY
HARDWARE						
FLYAWAY/ ROLLAWAY						✓
WEAPON SYSTEM	✓	✓	✓	✓		
PROCUREMENT	✓		✓		✓	
DEVELOPMENT			✓		✓	
PROGRAM ACQUISITION			✓		✓	
OWNERSHIP						
LIFE CYCLE						✓

Figure 7-5
SPECIFYING UNIT COST

- UNIT COST = DOLLARS ÷ QUANTITY
- BEFORE DISCUSSING UNIT COSTS PARTIES MUST AGEEE ON
  - •• TYPE OF DOLLARS
  - •• TIME PERIOD OVER WHICH DOLLARS AND QUANTITY ARE MEASURED
- SEVERAL VARIATIONS APPEAR IN SOURCE DOCUMENTS:

TIME PERIOD OVER WHICH MEASURED	TYPE OF DOLLAR: CURRENT YEAR $	TYPE OF DOLLAR: CONSTANT FY—$
SINGLE YEAR	P1 CONGRESSIONAL DATA SHEETS	
OVER LIFE OF PROGRAM	CONGRESSIONAL DATA SHEETS SAR	SAR

XM-1 CASE ILLUSTRATION PROCUREMENT UNIT COST	CURRENT YEAR $	CONSTANT FY—$
SINGLE YEAR	CDS: FY 82 $2.367	CDS: N/A
OVER LIFE OF PROGRAM	SAR: $2.549	(FY 82 CONSTANT) BUSS: $1.906

Figure 7-6
PROCUREMENT UNIT COSTS FOR SELECTED ACQUISITION REPORT (SAR) SYSTEMS (AS OF 31 DEC 80)[1] ($ IN MILLIONS, QUANTITY MEASURED OVER LIFE OF SYSTEM)

SAR SYSTEMS	WEAPON SYSTEM UNIT COST		PROCUREMENT UNIT COST	
	CONSTANT FY 82 $	CURRENT YEAR $	CONSTANT FY 82 $	CURRENT YEAR $
AAH	6.585	9.383	7.145	10.182
BLACKHAWK	4.130	5.258	4.328	5.51
CH-47 (A TO D MOD)	5.933	8.668	6.270	9.16
COPPERHEAD	.020	.025	.020	.025
DIVAD GUN W/O AMMO	3.558	5.741	3.936	6.353
FVS (VEH ONLY)	1.04	1.558	1.11	1.654
HELLFIRE (MSL)	.018	.025	.018	.025
MLRS (ROCKET)	.0059	.0083	.0059	.0083
MLRS (SPLL)	1.667	1.935	1.912	2.256
M198	.385	.330	.388	.333
PATRIOT (MSL)	.433	.543	.433	.543
PATRIOT (FIRE UNIT)	43.716	54.733	48.034	60.139
PERSHING II (MSL)	1.701	2.130	1.701	2.130
PII BATTERY SET (TOTAL)	N/A	N/A	21.5	26.9
ROLAND (MSL)	.258	.230	.258	.230
ROLAND (FU + VEH)	19.73	17.583	19.73	17.583
SOTAS (DIV SET)	71.7	109.0	84.145	127.9
STINGER (BASIC MSL)	.042	.051	.042	.051
TACFIRE	3.875	2.9	4.135	3.095
XM-1	1.831	2.448	1.906	2.540

Figure 7-7
XM-1 CASE ILLUSTRATION[1]

UNIT COST TERM[2]	CONSTANT[3] FY 72 $(K)	CURRENT FY $(K)
(1) HARDWARE UNIT COST	642.6	2235.9
(2) ROLLAWAY UNIT COST	676.1	2312.9
(3) WEAPON SYSTEM UNIT COST	720.0	2448.1
(4) PROCUREMENT UNIT COST	752.9	2548.7
(5) PROGRAM ACQUISITION UNIT COST	833.9	2680.7

NOTE: 1. EXTRACTED FROM UNIT COST SUMMARY PREPARED IN CONJUNCTION WITH SAR, 31 DEC 80.
2. UNIT COSTS ARE MEASURED OVER THE TOTAL PROGRAM LIFE.
3. FY 72 IS BASE YEAR FOR XM-1.

CHAPTER 8
Engineering, Production, and Software Management

More information is available on the subject of engineering management than on any other aspect of joint acquisition. The range extends from DOD-wide authoritative documents—the Defense Acquisition Regulation (e.g., DAR 1-324, "Warranties"), Military Standards (e.g., MILSTD 490, "Specification Practices"), DOD and service directives, instructions, regulations, orders, pamphlets, etc.—to purely informational sources, such as articles in professional journals. References to the functional areas covered vary from the formal, e.g., "life cycle cost factors," to the idiomatic "ilities": reliability, availability, maintainability, transportability, supportability, etc.

The joint program manager will not personally be able to "manage" these engineering functional areas, in spite of the fact that they comprise the substance of the program. Depending on the program management office structure, self-contained vs. matrix (see Chapter 6, "Organization and Staffing"), the joint program manager must determine how much effort he personally can expend in keeping his engineering functional teams directed toward the specific program goals.

Consistent Approach to Engineering Management

There are some factors in engineering management that are clearly in the joint program manager's favor. The operational requirement, which drives engineering, should have been well established during the joint service interplay. The acquisition strategy, which also provides direction to engineering management, i.e., P^{3}I (Preplanned Product Improvement), must be integrated into the engineering planning. Also, a great deal of inter-service and DOD cooperation has been expended toward the development of common standards in engineering disciplines. Regardless of his service attachment, the director or a member of an engineering division will be familiar with the core requirement for that function. For example, reliability programs in all the services have their roots in the DOD-wide MILSTD 785. Similarly, all maintainability programs are based upon MILSTD 470.

"The tailoring of standards, specifications, and data requirements is another factor that will aid the program manager. Current OSD and service direction requires the modification of these documents to meet system development and management needs.[1] OSD established the practice of selective application of standards and specifications to enhance cost-effective acquisition and life cycle ownership of systems in 1977. The directive to reduce the blanket application of all available contract clauses was promulgated upon the findings of the Defense Science Board Task Force on Specifications and Standards that misinterpretation, overdemonstration of compliance and rigid enforcement of specifications and standards by Government authorities and by contractors was the primary contributor to late and more-costly-than-estimated systems.[2] The joint program manager should be especially alert to the specification tiering effect, in which literally hundreds of detailed specifications are called out automatically by the citing of a general specification or standard. Blanket application and specification tiering is now being controlled by requiring the justification of the documents cited in the solicitation, and by limiting the application of the documents to only those cited to the extent specified."[3]

The deft management of the "ilities" is also facilitated by the knowledge that many of the engineering management practices have their vogue periods, champions and detractors. Value engineering, tailoring, "should cost," reliability, and maintainability warranties all have flowered. Those which lose their attraction, either because of a loss of their effectiveness or their promoters, generally do not disappear, but linger. Transportability is an "ility" which is not subject to vogue trends; equipment or structures which are to be transported must be transportable. The joint program manager should seek the advice of executive and participating service experts to learn which are effective and accepted tools.

Production Management

Production management goals are to: (1) accomplish production planning during the development cycle in acquisition programs, (2) document and review pertinent production criteria before the decision to produce, and (3) monitor the production program after that decision is made.

Production management must ensure that designs are capable of effective and economical production under quantity manufacturing conditions. Production risks must be detected and resolved to minimize the financial commitments associated with the decision to enter production. Production management involvement begins with determining leadtimes, schedule requirements, and production reporting requirements, analyzing contractor responses, and providing an active production interface with other functional specialists. Industrial processes, techniques, and controls involved in manufacturing and delivery should be surveyed continually to determine whether the program plan and milestones are being achieved, to anticipate problems, and to take action to prevent or minimize adverse impact.

Production management seeks to ensure that (1) production feasibility is properly assessed; (2) management possesses potential schedule impacts; (3) plans for quantity production effect the most economical and efficient use of manpower, materials, machines, facilities, and methods. An active role is taken in Preliminary Design Reviews (PDRs), Critical Design Reviews (CDRs), and other program reviews during the design and development phases of the program.

Production Readiness Reviews (PRRs) should be accomplished and documented before the production decision to ensure that a practical, transportable, and producible engineering design has been accomplished, all important engineering and manufacturing process problems have been resolved, the contractor has adequately planned for production and has the manufacturing and technical capability to produce the given system.

The program office should implement liaison and operating procedures to ensure effective Government involvement with the contractor sufficient to establish a strong and mutually knowledgeable relationship between the procuring activity, contract administration activity and the contractor. Surveillance of the contractor production operations should be accomplished in sufficient depth to fully protect the interests of the Government in accordance with Section 25 of the Defense Acquisition Regulation (DAR-ASPR).

RFPs and SOWs for the full-scale development phase and production phase contracts incorporate requirements for the contractual preparation of manufacturing and production plans, including the make or buy plan, and establish the basis for program office/CAO/contractor involvement.

When a full-scale development phase has been accomplished by the contractor selected for the production effort, make or buy planning may have been performed and may require only an updating for production. If not, the make or buy plan may be secured as part of the production plan. It must be available before negotiation and continuously updated for review and approval to ensure that the contractor does not create in-house capability at the expense of the Government when adequate capability exists from a qualified competitive source.

The SOW, the approved Manufacturing and Production Plan, and the contract's requirements for manufacturing and production reporting, establish the basis for monitorship by the program office and for the surveillance by contract administration.

Software Management

Control of the development of software and its documentation is a requirement which has become more significant and demanding with the increasing degree of incorporation of computer technology into military systems. The voluminous and esoteric nature of computer software makes its management extremely challenging. The Joint Program Manager (JPM) is tasked to determine and direct the steps necessary to keep the software development from becoming an impediment to project completion. Additionally, the JPM will ensure that the potential for interservicing of software is reviewed and that all software support options are fully analyzed. Of all the tasks performed by the JPM, one of the most important entails working closely with using and developing activities to ensure that the resulting system fulfills its designated requirements. This task becomes more and more challenging as the system deployment date approaches. The JPM also must contend with the fact that each of the armed services has different software configuration management policies which will complicate the management of any Joint Service Project. Regardless of the policy differences in software configuration management, the JPM must maintain configuration management control of the software as long as the engineering responsibility remains with the JPM. The JPM must also consider future requirements to ensure sufficient memory core will be available to preclude costly modifications.

One of the goals of the Joint Logistics Commanders is standardization of software management policy as it applies to Defense systems containing tactical embedded computers. At the present time efforts are underway to establish a joint service policy document, to establish joint service software development standards, to promulgate a tri-service software quality assurance policy/development standard, and to develop a unified group of Data Item Descriptions (DIDs).

Configuration Control

One facet of engineering management that will require increasing attention by the joint program manager is the need to control engineering changes. Of the many factors which contribute to the pressure for engineering changes in system design, three are significant and, unfortunately, inter-related. First, validated changes to system requirements by the sponsoring organizations inevitably lead to changes in the system design. The joint program manager should be especially alert to these and must require that sponsors recognize that incrementally changed requirements can bring about a virtually new program. Second, pressure for change comes from the technology community—government and contractor laboratories—who find a better way to accomplish the original requirement after acceptance of a preliminary design. Developmental tests will, of course, bring to light those system specifics which require change to allow the system to work. The third, and most insidious, source of pressure to change a design is not really separate from the first two at all. It is the seemingly geometric rate of technological advancement in today's world which would require a system to be conceived, designed, tested, produced, and fielded in a year to prevent its obsolesence before deployment. It is this last pressure which will cause a program never to reach fruition if the program manager cannot resist incorporating every "improving" change. He must establish a psychology against change.

The Standard Integrated Support Management System (SISMS) discussed in Chapter 9, "Logistics," provides configuration management guidelines and provides a bibliography of directives and standards which specify the details of a configuration management plan and an outline for a configuration management joint operating procedure. The service configuration management regulations, as well as SISMS, prescribe, in varying formats, the means to systematically identify, evaluate, coordinate, approve, and implement, or disapprove changes in a configuration. The plan must treat information such as:

- Proposed level of authority and indenture for change control at the start of engineering development and the anticipated expansion of this control as the design and testing progresses
- Requirements for contractors' internal configuration management systems
- Change analysis and approval procedures
- Configuration accounting data elements and functions on which data will be collected
- Plans and timing for the audit of configuration
- Timing and criteria for the application of the product configuration baseline and rationale supporting the timing
- Plans to handle production change testing
- Ensure interface with existing systems

The building blocks are well documented and presented. It remains only for the joint program manager to infuse a sense of priority and management interest into the plan by his devotion of some time and attention to it.

The joint program manager may get more pressure for changes in system design than will a single-service program manager because of requirements changes from the participating services. Well-defined requirements and the problems stemming from failure to achieve them prior to engineering development are addressed in Chapter 3. Changing requirements cannot be handled by configuration control board procedures, but the sponsors' knowledge of the program manager's resistance to unnecessary change may prevent incremental requirements upgrading from gathering momentum.

It is axiomatic in the field of program management that risk and commitment have an inverse relationship throughout the acquisition process. The program manager may wish to tie the parameter "resistance to change" to that of commitment in his program management plan so that at each succeeding development milestone, as risk is expected to decrease, resistance to change, as well as commitment, is expected to increase. The recognition of such a management policy by sponsors, developers, and contractors will preclude their interpretation of the joint program manager's early seeking of innovation as his continuing acceptance of change.

Footnotes

1. Department of Defense Directive 4120.21, "Specifications and Standards Application," 3 November 1980.
2. *Report of the Task Force on Specifications and Standards*, Office of the Director of Defense Research and Engineering, Defense Science Board, 1977.
3. Major R. J. Pratt, USAF, "Partitioning of Military Standards and Specifications," DSMC Study Project Report, PMC 77-2 (DDC Reference AD A050529).

Chapter 9
Logistics

Assignment of A Deputy Program Manager for Logistics

No other aspect of joint program management will confront the manager with as many inter-service differences as logistics. Even in the event that the program successfully develops a prime system that can meet the needs of all participating services with a single configuration, the services' support requirements are likely to be different, as will procedures for achieving effective support. The deputy program manager for logistics must orchestrate these various and often conflicting policies into a unified and cost-effective logistics program.

To be effective, the deputy program manager for logistics should be the same grade and have the same authority as the other deputy program managers. He should be delegated program management responsibility for developing, procuring, and deploying the support systems. This responsibility must include participating in design reviews and advising the joint program manager of the support implications of alternative system designs, as well as planning the integrated logistic support.

The deputy program manager for logistics should be provided by the service expected to bear the greatest burden of supporting fielded systems. For most programs that will be the executive service. However, from time to time, one service will be designated the executive service because of its technical abilities in a field rather than its dominant share of production. In such programs, the participating service which has the acquisition responsibility should provide the deputy program manager for logistics.

The deputy program manager for logistics may be either a civilian or military officer and is normally assigned by one of the Army Readiness Commands, the Navy Systems Commands or the Air Force Logistics Command. Ideally, he should be a graduate of the Program Management Course conducted by the Defense Systems Management College at Fort Belvoir, and he should have experience at several levels of logistics management.

Operating Concepts

The starting point for logistics planning is an understanding of how the equipment will be used: the mission, the operating environment, the tactical deployment, and the forces that will use and support it. It is essential that the operating concept be prepared for each alternative by Milestone I and finalized by Milestone II. The operating concept should be clearly understood by the joint program management team.

Logistics planning must begin at the initial program milestone, i.e., program initiation. It is at this point that the deputy program manager for logistics will review the mission element need statements (JMSNS) and establish the baseline equipment operation and logistic environment. All of the services should support the deputy program manager in formulating an initial logistics planning document, such as the Joint Intergrated Logistic Support Plan (JILSP). Appendix D describes the recommended content and format of a JILSP. Given identical equipments, the four services will employ them differently, thereby generating different logistics requirements. In fact, their different operating concepts are certain to influence the equipment and support system design significantly. The JILSP will focus management attention on the problems that different operating concepts may create in terms of equipment design and support system alternatives. The JILSP will also act as a cohesive agent, forcing the services to establish and integrate their logistics plans early. The integrated support plan (ISP) prepared by the contractor should complement the JILSP and reflect the contractors approach to complying with the logistics requirements established for the joint program.

In all the services, the operating commands determine how a system is used. In the Army, the Training and Doctrine Command (TRADOC) normally represents the eventual user. In the Navy, the mission sponsor (e.g., the Deputy Chief of Naval Operations for Air Warfare) usually prepares the plan for use and coordinates it with the Fleets. In the Air Force, the using command (e.g., Tactical Air Command) participates directly in the acquisition program, influencing, among other things, how the new system will be employed.

If the user (or his representative in the acquisition process) does not specify an operating concept the program manager must take the initiative, force the

issue and, in practice, set up some strawmen. As the program progresses through the acquisition process and the equipment design and capabilities become better defined, firm operating and maintenance concepts will evolve, but this evolution should not inhibit an early start toward documenting preliminary concepts. If these concepts are not defined early, the logistics planning baseline will not be properly established, and program schedule and cost will be adversely affected.

Support Concepts

Because missions, operating concepts, and operating environments differ from service to service, so also do standard practices, procedures, and doctrines for providing logistic support. There are differences in practically every aspect of support—the organizational structures, type of support available at each level, occupational skills, training, facilities, test equipment, and support environment. The differences, though not so great as to preclude effective support of virtually any equipment by any service, may be significant enough to influence dramatically the preferred equipment design (especially maintenance characteristics), the range of feasible support concepts, and the support resource requirements of each service.

Consider the services' standard maintenance structures. The Army, except for aircraft, usually distinguishes among four levels of maintenance:[1] organizational, direct support, general support, and depot. The Navy and Air Force recognize three levels, as does the Army for aircraft maintenance: organizational, intermediate, and depot. The Marine Corps usually follows Army practices for ground equipment and Navy practices for aircraft.

To the uninitiated, it might appear that Army direct and general support are comparable to Navy and Air Force intermediate maintenance, but that is not the case. Many maintenance tasks done at the direct support level in the Army would be done at the organizational level in the Navy or Air Force. Many of the general support tasks would be done at the Navy or Air Force depot.

Nor is it true that the intermediate level in the Navy always matches that in the Air Force. Ships, for example, must be largely self-sufficient; tasks which would be intermediate level on an Air Force System might be considered organizational level on a ship system. Even for aircraft and aircraft systems, where the similarities among the services' maintenance structures are most apparent, there are major differences in the environments, facilities, test equipment, and maintenance skills available at each level. To begin to appreciate the differences, one need only imagine the maintenance operations on a pitching, rolling deck of a ship or a hastily prepared jungle base compared to those on an established air field.

There are frequently also differences among the services in the proximity of support organizations to operating forces. Because of those differences, a support concept which would provide one service with acceptable maintenance turn-around times may be unable to support the desired level of operational readiness in another service.

To do his job well, the deputy program manager for logistics must understand how each of the services normally supports the type of equipment being acquired by the joint program. He has to educate himself. His best source of information in the Army is the TRADOC centers and schools; for example, the Combined Arms Center and School, Fort Leavenworth, Kansas. In the Navy, the initial contact should be the appropriate systems command, but an effort should be made also to visit one of the fleets. In the Air Force, visits to the Air Force Logistics Command and a using command, such as the Tactical Air Command, Langley AFB, should provide the necessary background. In the Marine Corps, a visit should be made to the Marine Corps Development and Education Center at Quantico, Virginia.

In short, the deputy program manager for logistics should get out of his office and see how the other services really support their forces. He will then have an appreciation for the differences among the services and a sound basis for developing a support system (or support systems) that will be effective, economical and implementable in each service.

Milestone Planning

The single most important task facing the logistics manager is milestone planning (scheduling). A good milestone program will save countless program dollars and man-hours. The three major benefits of a well designed milestone system are:

—Total program overview and direction
—A planning guide allowing the visability required in monitoring the various logistics contract data items
—Evaluation and impact of schedule changes.

Milestone planning appears to be the most ignored area in joint programs. Too often, management sees a milestone system as a hindrance rather than the valuable tool it is. In fact, a well designed milestone

Footnotes

1. The Army actually identifies five echelons of maintenance, the first two of which (user and unit maintenance) are both considered organizational level.

system will allow the joint program manager or the deputy program manager for logistics to better unify the various services' requirements.

There are many ways to construct a milestone system. The most basic method is to use a chart showing due dates versus completion dates for the various program and contract elements. Normally, a chart of this type is required by the various planning documents such as the JILSP. One step beyond this is to use a standard program evaluation review technique (PERT) or critical path method (CPM) system which will identify problems more readily than a simple chart. The deputy program manager for logistics cannot know all of the ramifications of a schedule change, but with PERT or CPM, at least some of the effects of a change can be known. For example, because the various logistics elements are interdependent, a schedule change in the technical manuals area will affect the training development, which in turn, will affect testing, etc. Proper milestone planning will mean the difference between successful logistics management and failure.

Milestone planning is being aided by a variety of automated techniques, many of them available commercially and some used routinely by contractors. One of the more innovative systems automates the PERT. Enhancements to the automated PERT include:

—Automated flagging of due dates and pre-set suspenses

—Automated program reconfiguring, based upon different funding or planning profiles

—Automated critical path reconfiguring based upon program slippages

—Current status reporting

A well-designed milestone planning system will form the core of the logistics effort in a joint program. It is up to the deputy program manager for logistics to insure that such a system not only is implemented and maintained, but is linked directly to the milestone planning system for the entire joint program. The DPML should consider that automated systems are available from government and commercial sources to track milestones and pinpoint problems in sufficient time to initiate required action.

Logistics Support Analysis

The logistics support analysis (LSA) program was initiated in 1973 as a joint service program. The details of this program are described in MIL-STD-1388. The joint program manager should be familiar with this MIL-STD. The objective of LSA is to establish within systems engineering a process that will establish logistics as a design parameter and mold the individual engineering disciplines into a cohesive unit. There are two key elements of the LSA process that contribute to the integration process. The first is the establishment, within the design activity, of logistics oriented tasks that are directly relatable to such engineering efforts as reliability, maintainability, and standardization. The tasks are tailored to the specific characteristics of the engineering program. The second key element in the LSA process is the establishment and use of a single integrated data base. The data base (see Table 9-1) will be the sole source of design related logistics data pertaining to the engineering effort. The data system provides contractors an information system for accomplishing system engineering and is used to satisfy government data requirements. The LSA deserves the highest visibility within the joint program office. The advantages of such a common data base for individual logistics functions include reduced costs, shorter procurement leadtimes, and simplified data maintenance and documentation. In a joint program, there is the additional advantage of spreading the costs of developing an LSA data base over two or more services.

Use of LSA will enable the deputy program manager for logistics to consolidate the various data requirements generated by the services into a single cohesive contractual record. Although it may first appear that consolidation of the requirements is nearly impossible, the problem can be overcome by carefully reviewing each service's requirements and letting the service with the greatest requirements prepare a single set of contract requirements.

Standard Integrated Support Management System

Development of the standard integrated support management system (SISMS) was sponsored by the Joint Logistics Commanders to provide a uniform approach to planning and managing the logistics support of multi-service programs. It has been implemented by regulation or instruction in all the services:

—U.S. Army Materiel Development and Readiness Command, DARCOM-R 700-97

—Naval Material Command, NAVMATINST 4000.38

—Air Force Logistics Command, Air Force Systems Command, AFLC/AFSCR 800-24

—U.S. Marine Corps, MCO P4110.1A

This regulation directs that SISMS be used for all multi-service programs and that it be considered for use on all other programs. The Army has directed that SISMS be applied to all Army acquisition programs, multi-service or not.

Table 9-1
LOGISTICS SUPPORT ELEMENTS AS SUPPORTED BY THE LOGISTICS SUPPORT DATA FROM LSA

ELEMENTS OF LOGISTIC SUPPORT / LOGISTIC SUPPORT DATA	MAINTENANCE PLAN	MANPOWER AND PERSONNEL	INITIAL PROVISIONING AND SUPPLY SUPPORT	SUPPORT AND TEST EQUIPMENT	TRAINING AND TRAINING DEVICES	TECHNICAL DATA	SOFTWARE SUPPORT	TRANSPORTATION AND HANDLING	FACILITIES
HARDWARE IDENTIFICATION	✓	✓	✓	✓	✓	✓	✓	✓	✓
MAINTENANCE REQUIREMENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓
MAINTENANCE LEVEL	✓	✓	✓	✓	✓	✓	✓	✓	✓
TASK FREQUENCY	✓	✓	✓	✓	✓	✓	✓		✓
TASK TIME	✓	✓		✓	✓	✓		✓	✓
TASK DESCRIPTION	✓	✓		✓	✓	✓	✓	✓	✓
PARTS REQUIREMENTS	✓		✓	✓		✓			
TOOL REQUIREMENTS	✓	✓		✓	✓	✓			✓
SUPPORT AND TEST EQUIPMENT REQUIREMENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓
FACILITY REQUIREMENTS	✓			✓					✓
PERSONNEL REQUIREMENTS	✓	✓		✓	✓	✓	✓	✓	

✓—INDICATES DATA IS USED EITHER DIRECTLY OR INDIRECTLY IN PRODUCTS ASSOCIATED WITH THE ELEMENT OF LOGISTIC SUPPORT.

The intent of SISMS is to define joint operating procedures for those logistics functions not already standardized throughout DOD. The abbreviated SISMS table of contents presented in Table 9-2 indicates the range of disciplines covered. A typical SISMS chapter describes policies, references, responsibilities, and data items.

Deputy program managers for logistics should consider SISMS as the guide for developing support management systems for joint programs. SISMS should be followed as much as practicable, early in the program. Once a logistic planning approach has been started it is difficult to change because much of the planning and data are being procured from contractors. The SISMS approach is more likely to meet the needs of a joint program than is a service-peculiar approach. But there are many aspects of logistics planning for joint programs that are addressed neither by SISMS nor by service-peculiar procedures. Let us address them as lessons learned.

Lessons Learned

The following examples and advice have been provided by deputy program managers who are or have been responsible for the logistics aspects of joint programs. Not every joint program will share exactly the same experiences, but all will encounter similar situations brought about by differences among the logistics requirements and practices of the services.

Inter-Service Communication

It takes longer and requires more work to accomplish logistics planning tasks in a joint program than in a single-service program. It was noted at the beginning of this chapter that the logistician must deal with more inter-service differences than anyone else in the program office. Unlike many other inter-service issues, logistics issues cannot normally be resolved by escalation to a higher decision authority. Logistics problems normally concern nitty-gritty details that must be worked out among functional specialists, each of whom may not only have narrow interests, but may be convinced that there is only one way to perform a certain task: his way. Much attention must be devoted to details that would be handled routinely in a single-service program. The deputy program manager for logistics must ensure that key logistics personnel from each service are identified and that these personnel jointly participate in planning and establishing the logistics program. One

Table 9-2
STANDARD INTEGRATED SUPPORT MANAGEMENT SYSTEM TABLE OF CONTENTS

technique for accomplishing this is to establish a hierarchy of program review teams. These teams or committees should be oriented to the specific level deemed necessary. A hierarchy may be constructed as follows:

Level 1: Logistic Status Review Team. This team may comprise the program manager, the deputy program managers, the highest level representatives from the participating services, as well as any support personnel deemed necessary. Level 1 will review overall logistics policy, establish major milestones, and resolve problems that cannot be resolved at lower levels. This team may meet only three or four times a year, or when deemed necessary, by the program manager upon DPML's recommendation.

Level 2: Joint ILS Committee. This committee or team will comprise the deputy program manager for logistics and the key staff and management personnel among the services responsible for the logistics effort. This committee will act as a steering group for the logistics directives from the Level 1 team, the program manager or deputy program manager for logistics. In a large program, the Level 2 committee will be responsible for most of the communication and agreements in the logistics arena. This level will meet on an as-required basis.

Level 3: Subcommittees or Working Groups. This level will comprise the functional working level. This may include a group for provisioning, training, LSA, etc. The actual formatting, data requirements, training, and other integrated logistics support problems will be resolved by these various groups or teams. These groups will be established by the Level 2 committees and meet on an as required basis. Items that cannot be resolved at this level will be presented to the Level 2 committee.

Data

Few events will bring out the parochial interests of the services more quickly or more dramatically than the data call. It will probably be the first inkling the deputy program manager for logistics will get of the many different and sometimes conflicting practices among the services. Yet, he must bear in mind that there frequently are legitimate needs for service-peculiar data. For example, the Air force frequently does more in-house testing and analysis than the other services and needs data to support those activities. There also arise situations in which differences in test and evaluation criteria, training requirements, or support concepts lead to data requirements tailored to the needs of each service. The challenges will be first to ensure that all requirements are known, second to cull the essential from the nonessential, third to develop data item descriptions that satisfy all requirements, and fourth to verify that data requirements are completely and accurately stated in contracts.

Logisticians who have experience in joint programs point out that the data item descriptions in SISMS are perhaps the most useful information in the document. They should be accepted as the standard unless the reasons for modifying them are compelling. The same people note also that joint programs often are created by merging two or more single-service programs. One of the early tasks of the logistician is to provide inputs tomodify contracts to satisfy the data requirements of the participating services. If SISMS has been followed from the beginning, contract modification probably will involve only additions. If SISMS has not been followed, satisfying the participating services' requirements may be expensive or even infeasible.

Supply Support

Provisioning is the heart of supply support planning for a new system. All services follow essentially the same well defined provisioning policies. A list of the basic references is in SISMS, Chapter 4. The procedures for implementing the policies, however, vary from service to service, and there is no checklist to guide the joint program. The best advice to the deputy program manager for logistics is to start early, include the participating services in planning the provisioning procedures, and expect provisioning for the joint programs to take much longer and be more confusing than provisioning for a single-service program. The following issues are typical.

> Each service has its own supply system, governed by its own procedures, and automated through its own computer systems. When an item managed by one service is requisitioned by another, the requisition starts in the originator's automated support system, is withdrawn from that system and processed manually, then entered into the managing service's automated supply system. Not only is the inter-service requisitioning process cumbersome, but there are more than the usual opportunities for error. The most common errors are incorrect stock numbers, failure of the executive service to register the requisitioning service as a user, omission of the funding citation,

and misplacement or mishandling of the requisition in the manual system. In multi-service provisioning it is imperative that a monitoring program be instituted for the cataloging/provisioning phases of the program. Without monitoring the system, many catalog transactions are rejected and not controlled. Actions processed through the cataloging system may subsequently be rejected in various interface systems. One goal of provisioning is to lay the groundwork for avoiding such errors. The Defense Logistics Agency (DLA) with its various centers will be the central inventory control point for many items that are used across service lines. A well organized joint service program will have a single service doing all the provisioning for a particular hardware configuration. This will eliminate duplication of effort as well as minimize costs.

The source, maintenance and recoverability (SMR) coding for an item may be different for each service participating in the joint program. The differences may be the result of different support concepts, or they may result from the use of different criteria for determining level of repair. The services do not use the same model for determining optimum repair levels. For example, the Air Force uses repair level analysis (RLA) and the Navy uses level of repair analysis (LORA). Though the models are similar, they make different assumptions about such parameters as turn-around times, pipeline quantities, and repair costs, and their results are frequently different.

The services should consider the use of a single-level of repair model and the relevant data values for that model should be obtained well in advance of the SMR coding process. Although variations in SMR codes among participating services are possible, they should be avoided if practicable. Early agreement on repair level models and the phase of the program when logistics support capabilities will be acquired will reduce the need for differing SMR codes. Without early agreement, there may not be enough time to negotiate procedures to allow the services to use their differing maintenance concepts with a single SMR code.

The normal timing and sequencing of provisioning events vary from service to service. For example, prescreening by the Defense Logistics Services Center to determine if national stock numbers have already been assigned may be done early in the provisioning process by one service and late by another. The timing of provisioning events may also be affected by differences in the initial support dates for each of the services. These timing and sequencing issues should be resolved in initial planning for the provisioning.

Support Equipment

If support concepts for a system differ among the services, chances are that the requirements for support equipment will also. Moreover, the services may wish to use their own, automated general purpose test equipment, rather than procure new equipment. This will create a requirement for service-peculiar software. For example, the Navy has versatile avionics shop test (VAST) aboard its aircraft carriers, the Army is using the AN/USM-410 and the Air Force is developing modular automatic test equipment (MATE). The three test systems are not compatible; each requires unique software. However, duplication can be minimized by using a single set of data for the software programming effort.

Although maintenance concepts of the services may dictate use of different support equipment, development of new peculiar SE may not be required. The existing DOD inventory should always be examined for a previously developed item which would effectively satisfy requirements. Agreement on the phase of the program in which automated test equipment software will be procured, as well as on what requirements are peculiar should be reached very early in the program.

Technical Manuals

The services have fundamentally different requirements for technical orders (TOs) or technical manuals (TMs). These differences exist because the characteristics of the intended users are different. The typical Army user may not have graduated from high school, has only entry-level military training, and has little experience. To meet his needs, the Army buys skill performance aids: simple, very explicit manuals structured in prescribed formats and written to a specific level of comprehension. They are expensive. The typical Air Force user is a high school graduate who is expected to have more technical training and experience than his Army counterpart.

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Consequently, the Air Force technical orders are akin to contractor's technical documentation and depend upon the technician's greater knowledge of the equipment. The Navy Functionally Oriented Maintenance Manuals fall midway between the Army manuals and Air Force technical orders, both in simplicity and conciseness.

The deputy program manager for logistics must critically examine the characteristics of the intended users in each service and balance the needs of his program for technical orders or manuals with the needs of the other services. In doing so, he should ensure that the documents are compatible with the support concept and training plans. He should also expect each of the services to vigorously defend its own approach to structuring technical orders or manuals. One recent concept being formulated to minimize the problems associated with TOs and TMs is to redefine the target (i.e., using) audience. By tailoring the range of the audience to include Army, Navy, and Air Force personnel, a single set of TMs (TOs) may be used. For example, a range would be given for reading levels, skill levels, or length of enlistment rather than a single specification. "Regardless of the format(s) chosen for technical orders, they should not contain terms peculiar to only one service. Even if separate manuals must be acquired for each participating service, the elimination of service-peculiar terms allows the contractor to better use the common data base and thus reduce cost."

Operational Test and Evaluation of the Support System

The approach to testing and evaluating a support system varies among the services. The Army policy is to use operational test and evaluation to validate the total support package prior to the production decision. This means selecting test personnel typical of those who will eventually operate and maintain the system, sending them through the same Army conducted training programs intended for equipment operators and maintainers, providing them with the same technical manuals planned for publication, and testing in the same operational environment with the same support concepts planned for fielded systems. Neither the contractor nor the developer participate in the test and evaluation. In contrast, Air Force operational test and evaluation is conducted by a cadre of well trained, experienced personnel. They are assigned to the program early enough to develop a broad understanding of the equipment and a working relationship with the contractor. The Navy approach, as is frequently the case, falls somewhere between those of the Army and Air Force. Testing is done in an operational environment by military personnel who usually have been trained by the contractor. Although support plans, training plans, and draft technical manuals are reviewed as part of the test and evaluation, there is no attempt to validate the adequacy of the support system as is done in the Army.

Although each of the services participating in a joint program will do its own operational evaluation (and sometimes its own operational testing), the deputy program manager for logistics will participate in preparing the test and evaluation master plan (TEMP). He also will be responsible for responding to the test findings and evaluations. Throughout the process he should keep in mind the differences among the services in purpose and approach to test and evaluation and not be surprised when requirements, findings, or recommended corrective actions conflict. For a more complete discussion of test and evaluation for a joint program, see Chapter 10.

Generating Interest in Logistics Requirements

The exploration of alternative support concepts and the examination of reliability and maintainability are integral parts of the prime system design. Identification of specific support requirements and development of the support system must be integral to the development of the prime system. Frequently, however, the tendency is to postpone too long the commencement of logistics planning activities. This tendency is not unique to joint programs, but the early logistics planning for joint programs also often suffers from lack of interest on the part of a participating service. Especially in joint programs in which there is no respresentative of the participating service assigned to the program office, the participating service may show interest in logistics only when the program approaches the production decision milestone. Of course, many logistics decisions must be made before then. The program manager and deputy program manager for logistics must insist that the participating service provide the information and support the program needs.

Personnel and Training

Rarely is there a one-to-one correspondence between Army Military Occupational Specialities (MOS), Navy Enlisted Codes (NEC), and Air Force Speciality Codes (AFSC). Thus, identification of personnel and training requirements may be unique to each service. The deputy program manager for logistics will need the assistance of the participating services to insure that those requirements are compatible with the services' personnel systems,

operating and support doctrines, and training systems. Single location training for all services can be cost effective and should be considered early in the planning cycle.

Depot Maintenance Interservicing

Depot Maintenance Interservicing (DMI) studies meet the JLC's objective for avoidance of unnecessary manpower, equipment, and facility duplications within the DOD. Standard policy and procedures for DMI are specified in Chapter 12, SISMS. The DMI new starts are identified by the acquiring or modifying service. When the DMI study is initiated by the special multi-service group, an analysis is made to determine existing capabilities among the services compared with the new acquisition requirements. The DMI requirement should be specified in all applicable contract SOWs and planning documents such as Joint Integrated Logistics Support Plans.

CHAPTER 10
Test and Evaluation

> Test and evaluation (T&E) shall begin as early as possible and be conducted throughout the system acquisition process to assess and reduce acquisition risks and to estimate the operational effectiveness and operational suitability of the system being developed . . .
>
> Successful accomplishment of T&E objectives will be a key requirement for decisions to commit significant additional resources to a program or to advance it from one acquisition phase to another. Acquisition schedules, financial plans, and contractual arrangements shall be based on this principle.

This extract from the policy section of Department of Defense Directive 5000.3, "Test and Evaluation," confirms what the joint program manager might expect—that T&E concerns begin early and mark every phase of development, acquisition, and deployment of a new system. T&E is an integral part of the acquisition process, not something that occurs after R&D is completed. Each service has its own T&E regulation[1] which implements the DOD directive, and amplifies the requirement of system conception-to-fielding test and evaluation. There is also a requirement in the United States Code for the Secretary of Defense to report certain test and evaluation data annually to Congress.[2]

The major tasks of test and evaluation in a system development and acquisition program are to assist in the design process of the system and to address the areas of risk as detailed in the DCP and the program charter or directive. T&E is conducted to demonstrate feasibility, to minimize design risks, and to determine the design alternatives and trade-offs necessary to best achieve program objectives during the demonstration and validation phase of the acquisition process. During the full-scale development phase, T&E progresses from component and subsystem checks to full system tests. The objectives then are to further determine that design risks are minimized, that the system design is complete, and that the system's military utility will justify production. Although development testing will predominate T&E considerations during this phase, operational testing must have been conducted to satisfy the questions concerning operational effectiveness and suitability before a production decision can be made.

Background

For some time prior to about 1970, the emphasis in the acquisition of defense systems was on "total package procurement"—a contract was let for a complete system development and procurement program after an initial paper study and definition phase. The theory was that if a program or system was sufficiently defined at the outset, a contractor could be expected to deliver the required product at a predetermined cost. Total package procurement did not work well in practice for a number of reasons, including overoptimistic cost and performance estimates and inaccurate initial definitions. The programs often experienced large cost overruns and significant performance deficiencies.

Several groups—the Blue Ribbon Defense Panel, the Commission on Government Procurement and the Defense Science Board—recognized the deficiencies of these practices. Partly as a result of their recommendations, new policies evolved that emphasized demonstrated performance as the pacing function for defense acquisition programs. The key feature of the new policies is the periodic review of the programs at critical milestones. During these periodic reviews by the Defense System Acquisition Review Council (for major systems), program progress is compared with program goals and objectives, and a decision is made to continue, redirect or cancel the program.[3]

For such comparisons to be effective, reliable and accurate measurements of program progress are necessary. Test and evaluation, the primary means for making such measurements, became the cornerstone of the new acquisition policies and were emphasized in their implementation. In addition to an OSD T&E authority being established (then the Deputy Director of Defense Research and Engineering [Test and Evaluation], now the Director of Defense Test and Evaluation), each service established, or gave new emphasis to, independent operational test agencies and headquarters staff focal points for conducting the required test and evaluation.

Types of Test and Evaluation

The two principal types of test and evaluation conducted in the acquisition process are Development Test and Evaluation (DT&E), and Operational Test and Evaluation (OT&E). DT&E is conducted by or under the supervision of the development agency to evaluate technical performance of prototype equipment. This testing is generally conducted by engineers and technicians—either contractor or government—in carefully controlled conditions. OT&E, on the other hand, is conducted exclusively by military personnel to determine the degree to which new equipment fulfills military operational requirements. It is, as a rule, conducted under conditions that duplicate as closely as possible the environment in which the equipment is expected to perform when deployed.

These assessments serve important functions in the acquisition process. DT&E assists in the actual design and development of a system in which initial designs are converted to hardware. It is an iterative process of test, note deficiencies, and fix deficiencies. DT can be used to validate—providing the necessary feedback for an orderly progression from initial design through engineering model stages to production prototype. Additionally, DT&E provides information on the progress of new system development. The progress is ascertained by comparing measured system performance with a set of technical goals and objectives for the program. A principal contribution of DT&E, especially prior to full-scale development phases, is the assessment of alternative system concepts and technical approaches.

OT&E, like DT&E, also provides essential information for decision-making by comparing system operational performance with operational objectives. Since OT&E is conducted before system production involves testing of prototypes—often competing prototypes—test results must be extrapolated to predict the operational performance and suitability of the final system.

Combined DT&E and OT&E are often conducted, especially early in the development of large, expensive systems or systems which will have a small number produced and fielded. Table 10-1 illustrates the services' T&E phases in relation to acquisition milestones and phases.

Production Acceptance Test and Evaluation (PAT&E) is the third category of testing conducted on production items to demonstrate that they meet contract specifications. PAT&E performing agencies and methods are more varied than those for preproduction T&E. Developing agencies sometimes are responsible for the conduct of PAT&E. Often the Defense Contract Administrative Service or the service plant representative (e.g., NAVPRO or AFPRO) will conduct PAT&E. In the Navy, acceptance testing of ships and aircraft is the responsibility of the Board of Inspection and Survey.

Independent OT&E Agencies and DT&E Facilities

One of the key recommendations of the Blue Ribbon Defense Panel implemented by SECDEF is the policy requiring each service to maintain a major field agency, separate and distinct from both the developing or procuring activity and the eventual user activity, to be responsible for the conduct of OT&E and the monitoring of DT&E. Each such agency is required to report the results of independent OT&E (normally by Independent Evaluation Report, IER) directly to the service chief, and to the Defense Acquisition Executive when appropriate. The services' independent OT&E agencies are are follows:

—ARMY—U. S. Army Operational Test and Evaluation Agency (OTEA), 5600 Columbia Pike, Falls Church, Virginia 22041

—NAVY—Commander Operational Test and Evaluation Force, (COMOPTEVFOR), Norfolk, Virginia 23511

—MARINE CORPS—Marine Corps Operational Test and Evaluation Activity (MCOTEA), Quantico, Virginia 22134

—AIR FORCE—Air Force Test and Evaluation Center (AFTEC), Kirtland Air Force Base, New Mexico 87117

The foregoing organizations were established by the services to fulfill the "independent OT&E" requirements of DOD policy. Each service has other activities that perform testing functions, generally within its development and acquisition structure. These activities are configured and staffed for technical, that is, development, test, and evaluation. These activities are normally specified for particular test support in a program's charter or charter-implementing documentation (e.g., the Test and Evaluation Master Plan [TEMP]) to provide test and/or evaluation support either independently or as monitor agency for contractor DT&E efforts. Some of these organizations are listed in Appendix C.

Initiatives Towards Inter-Service T&E Commonality

In February 1978, the Joint Logistics Commanders (JLC) established a Test and Evaluation Planning Guidance *Ad Hoc* Group. Its assigned task was to "assess the current joint testing environment, deter-

Table 10-1
TEST AND EVALUATION PHASES

ACQUISITION MILESTONE	0	I	II	III
ACQUISITION PHASE	CONCEPTUAL	DEMONSTRATION & VALIDATION	FULL-SCALE ENGINEERING DEVELOPMENT	PRODUCTION & DEPLOYMENT
ARMY T&E				DT III
DT&E	NOT CATEGORIZED	DT I	DT II	PRODUCTION TESTING
OT&E	NOT CATEGORIZED	OT I	OT II	FOE[1]/OT III
NAVY T&E				
DT&E	DT I	DT II	DT III(CTE[2]/NTE[3])	DT IV
OT&E	OT I	OT II	OT III	OT IV/FOT&E[4] (SHIPS MAY HAVE OT V)
AIR FORCE T&E				
DT&E	DT&E			
OT&E		IOT&E		FOT&E I[5]
				FOT&E II[6]

NOTES: 1. FOE: ARMY—FOLLOW-ON EVALUATION.
2. CTE: NAVY—CONTRACTOR TECHNICAL EVALUATION (TECHEVAL)
3. NTE: NAVY—NAVY TECHNICAL EVALUATION (TECHEVAL)
4. FOT&E: NAVY—FOLLOW-ON T&E
5. FOT&E I: AIR FORCE—FOLLOW-ON T&E I
6. FOT&E II: AIR FORCE—FOLLOW-ON T&E II

mine the best approach to resolve deficiencies in existing directives, and develop appropriate policy and guidance for greater commonality of test and evaluation effort." Since the JLC are individually the service material development and logistics commanders, and since the membership of the *Ad Hoc* Group represented development T&E interests, the group's implicit focus was on DT&E. The group conducted a thorough review of current T&E regulations and, with the assistance of its OT&E counterparts, polled test managers of over 20 joint programs. The following conclusions emerged:

—The existing multi-service directive (i.e., the July 1973 JLC MOA previously cited) provides clear and concise guidance for management of joint acquisition T&E programs

—The current Army, Navy, and Air Force T&E directives do not provide guidance consistent with the multi-service directive

—A mutual understanding of test terminology is essential

A few direct results of the T&E *Ad Hoc* Group's work are in evidence. Changes to current service regulations have been initiated which will require joint program testing to be performed in accordance with the directives of the executive service, consistent with the JLC Multi-Service Program Management Directive. A *Compendium of Test Terminology* was compiled, published, and made available to the T&E community.[4] Every joint program manager and multi-service T&E director will find the compendium invaluable.

A Multi-Service DT&E Commanders' Conference recommended that the *Ad Hoc* Group become a permanent joint acquisition DT&E interface and focal point with the JLC. That recommendation was implemented by the issuance of a joint regulation[5] which requires semi-annual meetings of the Group, undertaking of items recommended by the recurring Multi-Service DT&E commanders' Conference, annual review of the *Compendium of Terms* and coordination with the OT&E community on appropriate issues.

This is the first such initiative in the military test community and is expected to be the precursor to a greater degree of consistency in acquisition testing. The joint program manager and his test organization should take advantage of the continuing work done by the Group, whose members are:

Air Force

—HQ AFSC/TEVP (Office of primary responsibility for convening meetings)
Andrews AFB
Washington, D.C. 20334

—HQ AFLC/LOE
Wright-Patterson AFB
Ohio 45433

Army
—DARCOM/DRDCE-RT
5001 Eisenhower Avenue
Alexandria, Virginia 22333
—TECOM/DRSTE-TO-P
Aberdeen Proving Ground
Maryland 21005

Navy
—NMC/MAT O8D2
Washington, D.C. 20360
—NMC/AIR 6101
Washington, D.C. 20361

Marine Corps
—Director, Development Center D050-3
MCDEC
Quantico, Virginia 22134

Coincidental to this work towards commonality in development T&E, the OT&E Commanders, who currently meet to discuss mutual issues on a quarterly basis, appointed an *Ad Hoc* Group for Joint Service Testing in July 1978. This Group has produced a Memorandum of Agreement on Multi-Service OT&E and Joint T&E, cited later in this chapter, and intends to expand the agreements, as well as address other areas highlighted by the OT&E Commanders.

There is great potential for misunderstanding the Multi-Service environment because common or nearly common terms do not always have the same meaning in the different services. For example, consider the (deceptively) simple word "initial." When included in a phrase that has wide application and understanding such as initial Operational Capability (IOC) the Joint Dictionary[6] meaning prevails, and mutual understanding is facilitated. But unique application of the work in another, single-service environment may give rise to misunderstanding. The Army describes IOC FDTE[7] as a test activity which is conducted subsequent to a full production decision. The Navy[8] and the Air Force[9] both describe Initial Operational Test and Evaluation (IOT&E) as a test activity conducted prior to a first major production decision. It is easy to imagine the difficulties that could stem from several services planning a test program for a jointly developed system unless these concepts of "initial" testing were recognized and resolved. Recognition and resolution now have a starting point: *A Compenium of Test Terminology.*

As a rule, particular communities throughout the services are aware of service-peculiar practices. Activities which cut across service borders, such as those undertaken by professional societies and the Joint Logistics Commanders have promoted wider understanding of service-peculiar concepts and terminology by members of specific disciplines such as financial managers and logisticians. Of course, these disciplines occasionally develop phraseology whose shades of meaning are understood within the community, but not outside, irrespective of service association. The operational testing community, for instance, has found it necessary to make a specific distinction between "joint testing" and "multi-service" testing. The commanders of the services' independent operational test organizations have agreed that "joint T&E" means "an OSD directed and partially funded non-acquisition T&E program structured to evaluate system operational or technical performance under realistic conditions with two or more services participating or with interrelated/interacting systems." "Multi-Service OT&E" means "OT&E conducted jointly by two or more services for systems to be acquired by more than one service, or for a service's systems which have interfaces with equipment of another service."[10] This distinction was made to allow the service test organizations to differentiate between their acquisition-oriented test activity and that mandated by Department of Defense Directive 5000.3 under the direction of the Director of Defense Test and Evaluation. Thus the manager of a joint service acquisition program will probably be advised that "multi-service" rather than "joint testing" must be accomplished to fulfill the program's requirements.

Test and Evaluation Master Plan

—The Test and Evaluation Master Plan (TEMP) required by Department of Defense Directive 5000.3 is recognized throughout the test community as the controlling management document for identification and integration of all objectives, responsibilities, resources, and schedules for all aspects of T&E. In some cases, the name of the document has recently changed—the Army forerunner to the TEMP was the Coordinated Test Program (CTP).

—The TEMP is a formal, stand-alone and dynamic document. Department of Defense directive 5000.3 includes guidelines for the content and format of TEMPs. Briefly, the TEMP, or combination of TEMP supporting documents (System Test Plan [STP], and Program Introduction Document [PID]-Air Force, Outline Test Plan [OTP], and Test Design Plan [TDP-Army]) must contain:

—System description and intended operational mission
—Critical T&E issues
—Test objectives
—Required technical and operational characteristics, goals, and thresholds

—Integrated schedule including contracting demonstrations, preliminary evaluations (Navy), technical evaluations (Navy), Qualification OT&E (Air Force), in-process review (Army, less-than-major systems), type classification (Army), approval for service use (Navy), as well as required "standard" development and operational T&E and program milestones

—T&E resources required, including laboratory, ranges, test sites, instrumentation, major command or fleet (Navy) support needs, personnel, personnel training, logistic support, and funding by program element and appropriation perfiscal year

For major acquisition programs, OSD approval of the TEMP is a requirement for Milestone I and all subsequent milestones. Air Force Regulation 80-14 requires a TEMP for all Headquarters Air Force directed programs. Clearly the TEMP, like the Program Management Plan (or Joint Development Plan) which it supports, as well as the Integrated Logistics Support Plan, must be started early. The Test Division (Directorate or Joint Test Office), of the joint program office must work in close cooperation with the Executive Service organizations responsible for DT&E and OT&E, as specified earlier in this chapter. These organizations must integrate test and evaluation requirements of the specific program with those of other programs. Lead times for this planning and integration can be long; for instance the Army's Test Schedule and Review Committee considers the coordination among OT&E requirements and resources for a 5 year period. Initial versions of TEMPs will lack many specifics, but the iterative revision process will develop the necessary detail.

Multi-Service T&E Considerations

Service T&E directives specify that its T&E regulations will be followed for multi-service testing for which it is the lead service (e.g., OPNAVINST 3960.10 states: "All such JT&E for which the Navy is the lead service will be planned, accomplished in accordance with [Department of Defense Directive 5000.3] and this instruction, unless otherwise directed.") In general, service guidance is not provided when the specific service is not the lead service. The joint program manager and his test manager should be alert for the issue of changes recommended by the *Ad Hoc* Group so that all members of the test group will have consistent direction, and all branches and levels of the participating services are aware of their service policy to use the Executive Service test planning procedure.

The joint program manager should expect his test manager to promote specific testing by a single, consolidated—that is, with all interested services participating—test group whose reports would be available to service agencies for independent evaluations. (The procedure of "joint testing and independent evaluation" was a specific recommendation of the Defense Science Board's Acquisition Cycle Task Force.)[11] Championing that cause might be one of the most significant acts a joint program manager can perform to prevent proliferation of separate service testing from slowing his program.

Footnotes

1. Army Regulation 70-10, "Test and Evaluation during Development and Acquisition of Materiel," and AR 71-3, OPNAVINST 3960.10A, "Test and Evaluation," 31 July 1981. Air Force Regulation 80-14, 'Test and Evaluation." Marine Corps Order 5000.11A, "Testing and Evaluation of Systems and Equipment for the Marine Corps," 2 July 1979.

2. Section 139, Chapter 4 of Title 10, United States Code was amended by the FY 1974 Acquisition Act to require SECDEF to report to Congress operational testing and evaluation data on weapons systems for which procurement funds are requested.

3. See Chapter 5, "Program Review," for detailed description of the DSARC review process.

4. *Compendium of Test Terminology*, December 1978. Compiled by the Joint Logistic Commanders *Ad Hoc* Group on Test and Evaluation Planning Guidance, Defense Documentation Center reference, ADA 065-412.

5. AFSC/AFLC Regulation 80-24/DARCOM Regulation 70-64/NAVMATINST 3970.1/USMC Development Center Order 5000.2, 15 May 1979, "Joint Service Interface on Development Test and Evaluation."

6. JCS PUB 1, Joint Dictionary. "Initial Operational Capability—the first attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics, and which is manned or operated by an adequately trained, equipped and supported military unit for force."

7. Army Regulation (AR) 71-3, "TOC Force Development Testing and Experimentation," ICO FDTE.

8. OPNAVINST 3960.10, *op. cit.*

9. Air Force Manual (AFM) 11-1, "U.S. Air Force Glossary of Standardized Terms."

10. Memorandum of Agreement on Multiservice OT&E and Joint T&E, 27 March 1979 by Commander U.S. Army Oprational Test and Evaluation Agency (OTEA), Commander Operational Test and Evaluation Force (COMOPTEVFOR), Commander, Air Force Test and Evaluation Center (AFTEC), and Director, Marine Corps Operational Test and Evaluation Activity (MCOTEA).

11. Report of the Acquisition Cycle Task Force, Defense Science Board, 15 March 1978.

CHAPTER 11
Department of Defense Acquisition Improvement Program
(Reprint)[1]

We stand at a singular point in time. We have a unique opportunity to significantly improve the defense of our nation. It appears that there is the prevailing view among the American people that a larger percentage of our gross national product should be spent on defense. At the same time, we have been strongly alerted that we must be good stewards of our resources. In a fiscal year in which the DOD budget is scheduled to grow substantially, almost all other federal agencies will experience substantial budgetary cuts. With these gigantic, countervailing forces at work, the window available to us to make major advances in our preparedness may be very short—possibly as short as 1 or 2 years.

In full appreciation of this environment and its implications, Deputy Secretary of Defense Frank C. Carlucci took action. On 2 March 1981, he chartered five working groups—involving all of the services and inviting inputs from industry—to make recommendations with regard to improving the acquisition process. The report of the working groups was delivered on 31 March 1981. Mr. Carlucci's response to the report is best stated in his own words: "I have discussed the report with the Steering Group, the Joint Chiefs of Staff, the Service Secretaries, and the Under Secretaries and selected Assistant Secretaries of Defense. Based on the report and those meetings, the Secretary and I have decided to make major changes both in acquisition philosophy and the acquisition process itself." On 30 April 1981, Mr. Carlucci issued his decisions and identified 31 actions for implementation by DOD. Mr. Carlucci signed one more action on 27 July 1981, yielding the current total of 32 (see Figure 11-1). The actions became effective on the dates they were signed.

The purpose of this paper is to provide the program manager with a working knowledge of these 32 actions to improve defense acquisition. At the outset, it should be noted that while these actions compose a well-reasoned set, they are by no means all inclusive; they address many of the crucial acquisition management problems, but leave many important problems unsolved. It is at this point that the program manager can play a particularly vital role by building on the 32 actions, to point the way to many other actions to improve the acquisition process.

The 32 acquisition improvement actions fall into several classes. Many of the actions have already been implemented and the effects are already being felt in the field; others require high-level (e.g. congressional) approval or acquiescence. Ultimately, the program manager will benefit from these actions, but meanwhile, there is nothing he can do except respond to requests for data and supporting evidence.

By far the most important actions, however, are those which require decisions on the part of the program manager. These decisions will be based largely on the answers to two questions: (1) Is this action applicable to my program? and (2) What measures can or should I take in response to this action?

Before proceeding any further, it is appropriate to note that we have seen many of these words before. Accordingly, we have every right to ask, "So what is different this time?" The difference is this: Mr. Carlucci has also heard the rhetoric many times, and is determined to replace rhetoric with actions. The Department of Defense is prepared, perhaps more than ever before, to *demonstrate by its actions* its commitment to the principles of effective systems management. Indeed, the DOD has already demonstrated its commitment by a series of far-reaching measures. And the activity associated with implementing the remaining actions can best be described as "intense." The current revision of DOD Directive 5000.1, scheduled for late this calendar year, is an expression of the urgently felt need to use every available forum to describe the letter and intent of the acquisition improvement actions.

Background

One of Mr. Carlucci's first actions upon arriving in the Department of Defense was to ask people in the acquisition community to identify their most serious concerns. He received answers from all sectors, from Congress to the program manager. He found concerns with program turbulence, and the extraordi-

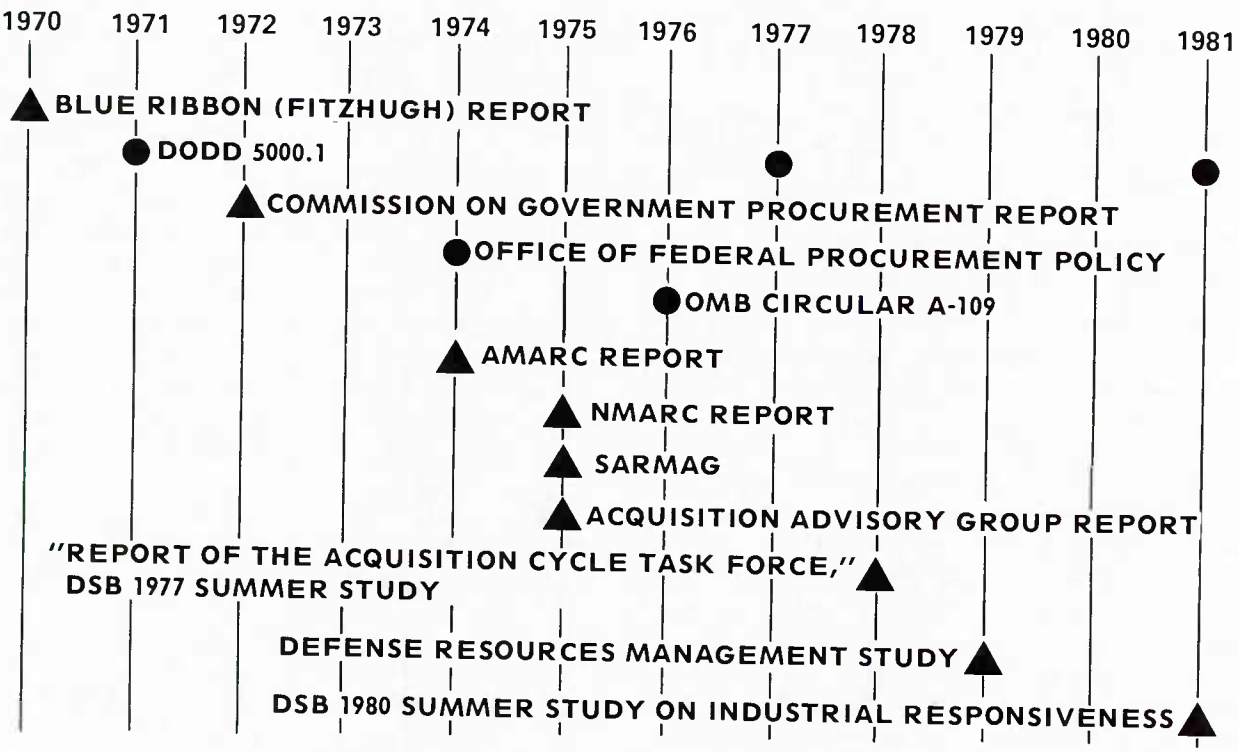
Figure 11-1
ACQUISITION IMPROVEMENT ACTIONS

1. REAFFIRM ACQUISITION MANAGEMENT PRINCIPLES
2. INCREASE USE OF PREPLANNED PRODUCT IMPROVEMENT
3. IMPLEMENT MULTIYEAR PROCUREMENT
4. INCREASE PROGRAM STABILITY
5. ENCOURAGE CAPITAL INVESTMENT TO ENHANCE PRODUCTIVITY
6. BUDGET TO MOST LIKELY COSTS
7. USE ECONOMICAL PRODUCTION RATES
8. ASSURE APPROPRIATE CONTRACT TYPE
9. IMPROVE SYSTEM SUPPORT AND READINESS
10. REDUCE ADMINISTRATIVE COSTS AND TIME
11. BUDGET FOR TECHNOLOGICAL RISK
12. PROVIDE FRONT-END FUNDING FOR TEST HARDWARE
13. REDUCE GOVERNMENTAL LEGISLATION RELATED TO ACQUISITION
14. REDUCE NUMBER OF DOD DIRECTIVES
15. ENHANCE FUNDING FLEXIBILITY
16. PROVIDE CONTRACTOR INCENTIVES TO IMPROVE RELIABILITY AND SUPPORT
17. DECREASE DSARC BRIEFING AND DATA REQUIREMENTS
18. BUDGET FOR INFLATION
19. FORECAST BUSINESS BASE CONDITIONS
20. IMPROVE SOURCE SELECTION PROCESS
21. DEVELOP AND USE STANDARD OPERATION AND SUPPORT SYSTEMS
22. PROVIDE MORE APPROPRIATE DESIGN-TO-COST GOALS
23. IMPLEMENT ACQUISITION PROCESS DECISIONS
24. REDUCE DSARC MILESTONES
25. SUBMIT MENS WITH SERVICE POM
26. REVISE DSARC MEMBERSHIP
27. RETAIN USDRE AS DEFENSE ACQUISITION EXECUTIVE
28. RAISE DOLLAR THRESHOLDS FOR DSARC REVIEW
29. INTEGRATE DSARC AND PPBS PROCESS
30. INCREASE PM VISIBILITY OF SUPPORT RESOURCES
31. IMPROVE RELIABILITY AND SUPPORT
32. INCREASE COMPETITION

nary difficulty we have with holding to our long-range plans. He found concerns with the burden of reporting and reviewing, and with the seemingly endless rounds of briefings. He found concerns with the cost of acquisitions, particularly the overhead and indirect costs, and with our inability to estimate costs realistically. He found concerns with the aging and shrinking industrial base. He found concerns with the length of the acquisition process, occasioned by many causes (sometimes by technical difficulties, sometimes by the decision-making process, often by the constraints of the budget process). He found concerns with the cost of ownership, including the costs of maintenance and support. And finally, he found concerns that performance and readiness of systems in the field and in the fleet were far below the level anticipated and needed.

At the same time, Mr. Carlucci was keenly aware of the numerous studies of the acquisition process that had been conducted over the past decade (Figure 11-2). In his view, we did not need another study—the time for action had arrived. It would, of course, be wrong to suggest that during the last decade no progress had been made in refining the acquisition process. The publications of DOD Directive 5000.1 and of OMB Circular A-109 were major achievements in the definition and refinement of the acquisition process. Of particular note in both of these documents is the strong emphasis on tailoring the acquisition process to yield the optimum acquisition strategy. In spite of such improvements, however, Mr. Carlucci's view was that in the past too much emphasis had been put on studying problems and too little on implementing solutions. Thus, the five working groups were chartered not to conduct yet another study of the acquisition process, but to look at solu-

Figure 11-2
MAJOR STUDIES OF THE ACQUISITION PROCESS



tions that had been proposed in the past and determine a course for future actions. Out of these study groups' findings and recommendations came the 32 actions designed to: (1) promote decentralization and participative management, (2) improve the planning and execution of weapon system programs, (3) strengthen the industrial base that supports the Department of Defense, (4) increase the readiness of weapon systems, particularly in the early stages of their lives in the field, and (5) reduce the burdensome administrative requirements that make the acquisition process more costly and time-consuming than necessary.

The 32 Acquisition Improvement Actions

Now let's look more closely at the specific actions. We will not examine them all in detail or in numerical order, but will instead consider them as they relate to the five primary objectives listed in the previous paragraph.

The 32 acquisition improvement actions are firmly rooted in eight fundamental management principles (see Actions 1 and 32). These principles were stated by Mr. Vincent Puritano, Executive Assistant to the Deputy Secretary of Defense, in an article in the October 1981 issue of *Defense/81* as follows:

> We must improve long-range planning to enhance acquisition program stability.
>
> Both OSD and the Services must delegate more responsibility, authority and accountability for programs; in particular, the Service program manager should have the responsibility, authority and resources adequate to execute efficiently the program for which he is responsible.
>
> We must examine evolutionary alternatives which use a lower risk approach to technology than solutions at the frontier of technology,
>
> We must achieve more economic rates of production.
>
> We must realistically cost, budget, and fully fund in the Five Year Defense Plan, and Extended Planning Annex, procurement, logistics and manpower for major acquisition programs.
>
> Readiness and sustainability of deployed weapons are primary objectives

and must be considered from the start of weapon system programs.

A strong industrial base is necessary for a strong defense. The proper arms-length relationships with industry should not be interpreted by DOD or industry as adversarial.

Defense managers at all levels should expand their efforts to obtain maximum competition for their contractual requirements.

Promote Decentralization and Participative Management

The first group of actions reflects what has been variously called "controlled decentralization" and "participative management," and is in line with Deputy Secretary Carlucci's desire for a major change in acquisition philosophy.

Our current way of doing business reflects two decades of increasing centralization. We have seen an increase in the number of reports and briefings; we have observed an increase in the number of directives and regulations; and we have experienced delays in the decision-making process.

To illustrate this point, consider the data in Figure 11-3, which illustrates the tortuous, time-consuming path to a Defense Systems Acquisition Review Council (DSARC) review. In fact, very few of these prebriefings are actually presented to offices within the Office of the Secretary of Defense; most are offered to line and staff organizations within the services.

Lest there be a misunderstanding, it should be noted that centralization has its distinct advantages. Moreover, every new regulation, policy, and procedure is conceived with the objective of helping us avoid a pitfall. However, we have become so superbly conscious of avoiding errors that we have added a heavy overburden to our process. (Note that in geology, "overburden" refers to the material that must be removed before one gets to the mineral-bearing ore in a mine.)

The objective of this thrust is to reverse some elements of the trend towards centralization. A particularly definitive statement of the Deputy Secretary's intent is provided in his 27 March memorandum: "We will achieve better defense management by working toward a system of *centralized control of executive policy direction* and more *decentralized policy execution* (emphasis added)." Thus, there is a clear delineation of responsibility: There are some decisions which clearly should be reserved for the highest levels; however, in most cases, decisions can and should be made at substantially lower levels in the organization. The succinct guideline for this distinction is stated in one of the management principles within Action 1: "Responsibility, authority and accountability for programs should be at the lowest levels of the organization at which a total view of the program rests."

The following five actions directly support this thrust:

24. Reduce the number of Secretary of Defense decisions.
28. Raise the dollar threshold used to select major programs for DSARC review.
17. Decrease DSARC briefing and data requirements.
26. Revise DSARC membership to include the appropriate service secretary.
27. Retain the Under Secretary of Defense for Research and Engineering as the Defense Acquisition Executive (DAE).

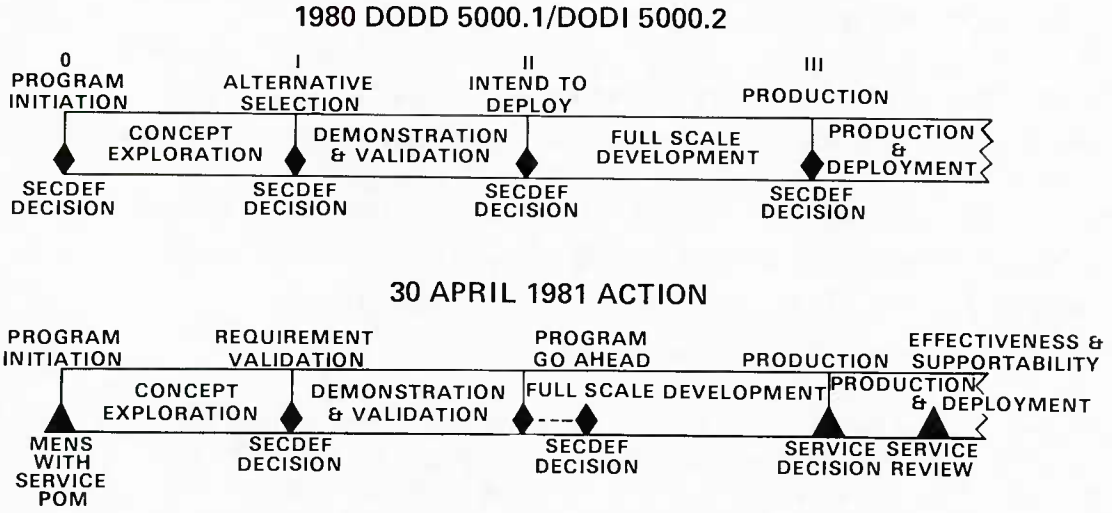
Action 24 cuts in half the number of Secretary of Defense decisions for major weapon system programs and reduces the number of DSARC reviews from three to two. The new process, illustrated by Figure 11-4, is already in force. Four features deserve special attention.

(1) Note that, although the Mission Element Need Statement (MENS) is no longer specifically approved

Figure 11-3
DSARC PREBRIEFINGS

PROGRAM	NUMBER
F-16 AIRCRAFT	56
JOINT TACTICASL INFORMATION DISTRIBUTION SYSTEM (JTIDS)	42
PATRIOT AIR DEFENSE SYSTEM	40
F-18 AIRCRAFT	72

Figure 11-4
MAJOR SYSTEMS ACQUISITION PROCESS



by the Secretary of Defense (Milestone 0), the new procedure requires that the MENS be submitted with the service program objectives memorandum (POM). Thus, the Secretary of Defense *does* tacitly approve the MENS when he approves the POM.

(2) The new milestone, entitled Requirement Validation, is effectively the same as the old Milestone I, Alternative Selection.

(3) The new milestone entitled Program Go-Ahead is no longer rigidly tied to the beginning of the full-scale development phase of the program. The objective of this new arrangement is to allow the program manager more flexibility in the development of his acquisition strategy. On the one hand, he may wish to stick with the traditional definition of Milestone II. On the other hand, he may wish to delay the Program Go-Ahead Milestone until after preliminary design review (PDR) or even after complete design review (CDR) so that he can develop a better view of the performance, cost, schedule, industrial base preparedness, supportability, and testing prior to the Secretary of Defense decision to commit to completion of full-scale development, production, and deployment. Normally the acquisition strategy, and hence the timing of the Program Go-Ahead milestone, will be defined and agreed upon at the Requirement Validation milestone. Regardless of the timing of the Program Go-Ahead Milestone, all contractual instruments must be responsive to the decisions of the Secretary of Defense and, for example, provide for the termination of the program at the Program Go-Ahead milestone (should the Secretary of Defense make this decision). (Needless to say, the intent of this action is not to create another milestone; the Program Go-Ahead Milestone *replaces* the Intend to Deploy milestone).

(4) The old Production Decision milestone has been returned to the services with the following proviso: The program must be within performance, cost, and schedule windows established at the Progam Go-Ahead milestone.

In a related action, the thresholds for programs to qualify for DSARC review have been doubled. The new thresholds are $200 million in research, development, test and evaluation funds and $1 billion in procurement funds. Note that the revised thresholds are stated in terms of FY 80 dollars; thus there is a built-in "cost of business" adjustment. This action has resulted in 10 programs being removed from the DSARC review process.

A brief note is in order regarding the major programs which were initiated "pre-Carlucci" and are *not* below the new DSARC review thresholds. These programs are being examined on a case-by-case basis to determine whether further OSD reviews are warranted. It is interesting to note in this regard that, in several cases (the KC-135 re-engining and the Tomahawk programs, for example), the Milestone III review has been delegated to the services.

Some progress is also being made in reducing the amount of material that will be prepared for a typical DSARC review. For example, the integrated program summary (IPS) has been eliminated for the Requirement Validation reviews; this action will, of course, require that the corresponding decision coordinating paper (DCP) contain complete cost information on

Figure 11-5
NEW DSARC MEMBERSHIP

- DEFENSE ACQUISITION EXECUTIVE (DAE, USDRE), CHAIRMAN
- USDP—UNDER SECRETARY OF DEFENSE FOR POLICY
- ASD(MRA&L)—ASSISTANT SECRETARY OF DEFENSE (MANPOWER, RESERVE AFFAIRS & LOGISTICS
- ASD(C)—ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
- DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
- CHAIRMAN, JOINT CHIEFS OF STAFF OR HIS DESIGNEE
- SERVICE SECRETARY OR HIS DESIGNEE

the alternatives to be considered. Dr. Richard D. DeLauer, Under Secretary of Defense for Research and Engineering, is also examining the possibility of shortening the IPS for the Program Go-Ahead reviews scheduled to be held at OSD.

In a fourth action dealing with the DSARC process, the membership of the DSARC has been increased to give the services a greater voice in the DSARC process. As noted in Figure 11-5, the service secretary of the appropriate service has been added to the DSARC membership. In the case of joint-service programs such as the advanced medium range air-to-air missile (AMRAAM) program, the secretaries of all involved services will be members of the Council.

Improving Planning and Execution

The root cause of difficulties in the area of planning and execution is, of course, uncertainty. Technical uncertainties are the most commonly cited. Technical uncertainties can also lead to schedule uncertainties; however, there are other sources of schedule uncertainty. Foremost among these is the necessity to stretch out a program in order to accommodate all of the desired programs within the constraints of a fixed budget. Cost uncertainties arise both from technical uncertainties and also from schedule uncertainties. But cost uncertainties, like schedule uncertainties, have independent origins of their own. In some cases, we are simply not able to estimate with the desired accuracy the future cost of research and development or of production programs.

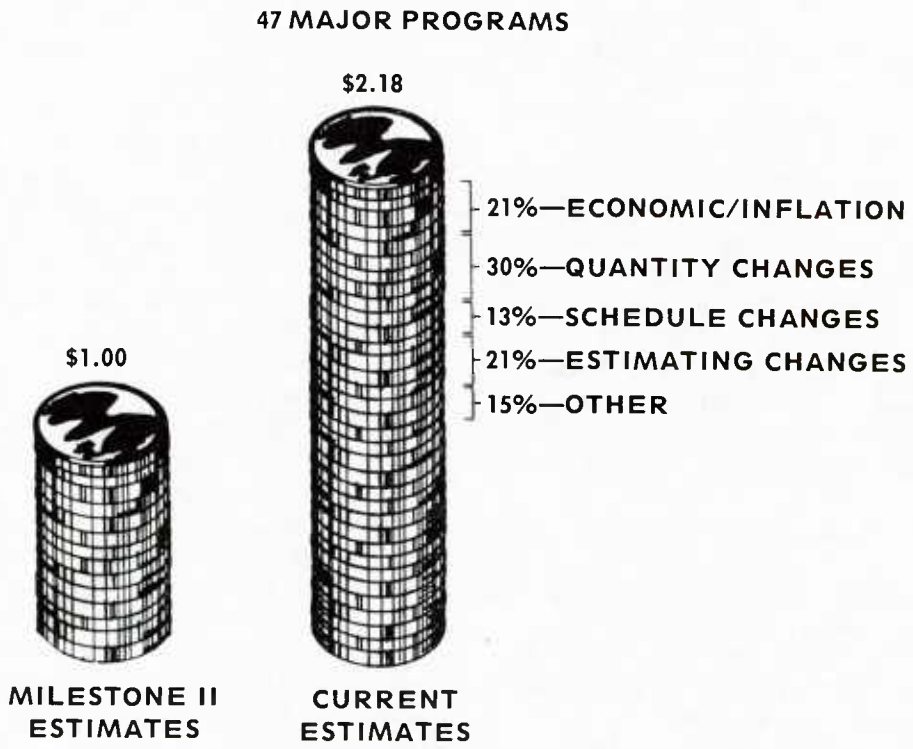
Common techniques for coping with uncertainties are well known. We adjust production rates annually; we cut soft programs in order to make funds available to other programs; we delete hardware items such as test hardware, and so forth. Among the consequences of these actions are program turbulence and cost growth. The extent of turbulence in the 47 major programs reported in the Selected Acquisition Reports (SARs) dated 30 June 1981 is illustrated by the following data: With respect to the acquisition strategy laid down at Milestone II, 40 of the programs have experienced changes in the number of units to be procured, and 41 of the programs have experienced schedule changes. Cost growth among these 47 major programs is illustrated in Figure 11-6. Note that slightly more than two-fifths of the 118 percent cost growth can be attributed to quantity and schedule changes. Cost growth due to estimating changes contributes another one-fifth.

An additional consequence of our current techniques for dealing with uncertainties is our lack of credibility both in the view of the Congress and also in the eyes of many people in the industrial sector. This consequence is a direct result of our apparent inability to stabilize our programs and stem the tide of cost growth. The Deputy Secretary of Defense is particularly concerned with this lack of credibility because it not only encourages the Congress to take a direct role in the management of our programs but also discourages much-needed capital investment by the industrial sector.

The uncertainties which are not within our grasp are primarily of a technical origin. They arise, in part, from the need to insert new technology as fast as possible to offset the numerical advantages of the Soviet Union and the Warsaw Pact. The following four actions are designed specifically to help cope with technical uncertainties:

2. Increase use of Pre-Planned Product Improvement (P^3I).
11. Budget for Technological Risk.
12. Provide Front-End Funding for Test Hardware.

Figure 11-6
COST GROWTH



15. Enhance Funding Flexibility.

Pre-planned product improvement (Action 2) reduces technical risk and increases the likelihood of meeting the initial operational capability (IOC) date by allowing the weapon system to be fielded *without* the ultimate state-of-the-art technology but *with* provisions for incorporating the higher technology at a later date when it has matured. There is, of course, an ancillary benefit in that a weapon system designed in anticipation of product improvements may provide a low-cost alternative to the development of an entirely new weapon system to counter a future threat.

To be effective, pre-planned product improvement must be an integral part of the acquisition strategy; this requires that the planning begin early in the acquisition cycle and that funds be set aside to develop the new technology. Note that, while P^{3}I is often thought of as a technique for upgrading the performance of a system, it may also be effectively used to upgrade the supportability and maintainability. Needless to say, the existence of a P^{3}I program should not be used as an excuse for allowing fielding of a system which fails to meet its initial performance and readiness goals.

Action 11 recognizes the traditional difficulty we have had in justifying and protecting funds (a type of management reserve) for unanticipated technical difficulties. In recent years both the Army and the Air Force have developed scientifically sound techniques for estimating the risk of a program and the contingency funds that should be set aside to cope with unanticipated difficulties. These techniques consider each element of the program (e.g., the elements in the work breakdown structure), assign a risk to each element, and use mathematical methods to combine the data and develop a measure of the risk for the whole program.

In this context, Action 11 requires the services to increase their efforts to quantify risk and to expand the use of budgeted funds to deal with uncertainty. Needless to say, there is an implied pledge by the DOD that effectively justified reserves will not be the first targets for budget cutting and redistribution exercises.

The primary objective of Action 12 is to reduce the length of the acquisition cycle while holding the risk at an acceptable level by providing additional test hardware so that developmental and operational

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tests can be conducted concurrently. Needless to say, this requires that the test hardware be built early in the program, and that the program manager resist the temptation (when faced with other pressing needs) to discount the importance of testing. Action 12 also stresses the importance of combined environmental tests, and the importance of the test-fix-test process (starting early in the program).

Action 15 recognizes that in some cases it is desirable to convert production moneys into RDT&E funds; a case in point is a program which is slated to enter production but has been delayed due to technical difficulties. Although the DOD has statutory authority to reprogram a total of $750 million a year between authorizations, the institutional impediments (review by OMB and by congressional oversight committees) virtually prevent these reprogramming actions. DOD is currently seeking relief from these impediments.

In addition to technical difficulties, a key source of program turbulence is the lack of discipline with which we plan for the out years. The following four actions deal directly with planning:

25. Submit the MENS with the Service POM.
29. Integrate the DSARC and PPBS Processes.
4. Increase Program Stability.
7. Use Economical Production Rates.

Mr. Carlucci put his finger on a key element of the problem in the following quotation from his 27 March 1981 memorandum on management of the PPBS:

> I agree with the consensus that we must both improve strategic planning in the early planning phase of the PPBS cycle and strengthen long-range planning throughout the other phases of the PPBS. This calls for a more disciplined planning process that will provide the framework, the goals and objectives, the appropriate military strategies, and the risks associated with the optimum allocation of available resources.

In this context, a key feature of the 27 March 1981 memorandum is the redefinition of the membership and role of the Defense Resources Board (DRB). The DRB is chaired by the Deputy Secretary of Defense and has been expanded to include 17 regular members, including all the members of the DSARC. Its charter includes:

—Reviewing proposed planning guidance;
—Managing the program and budget review process;
—Advising the Secretary of Defense on policy, planning, program and budget issues and proposed decisions;
—Evaluating and reviewing high priority programs on a regular basis;
—Assuring that major acquisition systems are more closely aligned to the PPBS.

In addition, the 27 March 1981 memorandum makes other specific changes to the PPBS process. For example, it required that the documentation for the FY 83 POM be cut by 50 percent and required that the comptroller slash the huge amount of paperwork required for the zero base budgeting (ZBB) process. More importantly, the memorandum charged key OSD offices with developing plans for significantly improving the OSD programming process. Thus, in a sense, the four acquisition improvement actions are but a small part of a much larger activity within the DOD.

Actions 25 and 29 are aimed at bridging the gap between the DSARC process and the PPBS process. Specifically, these actions require that, at each of the first three decision points in a program (Program Initiation, Requirement Validation, and Program Go-Ahead), the service guarantee that adequate funds are budgeted to carry the program to the next milestone. The requirement to submit the MENS with the POM was described earlier. In the case of the Requirement Validation and Program Go-Ahead milestones, the service secretary will assure the DSARC that sufficient resources are provided in the Five Year Defense Plan and the Extended Planning Annex (or can be programmed) to execute the program as recommended.

Action 4 requires that the Secretary of Defense, OSD, and the services fully fund both the R&D and the procurement of major systems at levels necessary to protect the acquisition strategy established when the program was baselined. Programs will be reviewed for compliance with this requirement during program and budget review by the Defense Resources Board.

So far in this section, attention has been focused on those actions which deal with technological risk and with planning. The following six actions are primarily aimed at improving costing and execution of weapon system programs.

6. Budget to Most Likely Cost.
8. Assure Appropriate Contract Type.
20. Improve the Source Selection Process.
22. Provide More Appropriate Design-to-Cost Goals.
18. Budget Weapons Systems for Inflation.
19. Forecast Business Base Conditions at Major Defense Plants.

It is, of course, realized that our cost estimating and budgeting processes have significant room for

improvement. At the same time, it is recognized that the problem is compounded as we struggle to fit more and more programs within the confines of a fixed budget. In response to this constraint, we often feel compelled to accept intentionally low initial cost estimates; this process, usually referred to as "buying in," frequently leads to apparent cost overruns an criticism of our management abilities.

The thrust here is twofold. On the one hand, we in the federal government are being required to take a much more vigorous role in cost estimating. We are asked to pay particular attention to predictable cost increases due to risk. And we are asked to develop more reliable estimates of cost and to stop relying so heavily on contractor estimates. On the other hand, the contractor is also required to give us more accurate cost estimates. To this end, a series of specific actions has been identified: (1) Improve the source selection process to place added emphasis on past performance, schedule realism, facilitization plans, and cost credibility; (2) Provide contractual incentives to encourage good performance with respect to cost goals; (3) Make design-to-cost a more viable tool by delaying fee awards until after the initial items have come off the production line and real production costs can be determined.

The objective of these actions is to reduce the number of overruns and to reduce the number of times that contractors feel they must "buy-in" in order to compete. At the same time, DOD recognizes that there are some other actions it can take to make your job easier. One of these is helping the program manager cope with unrealistic inflation rates. The difficulty with this initiative is, of course, the political implications. Effective techniques are being studied.

The last action in this group reflects the fact that fluctuations in DOD and non-DOD work tend to distort business base projections and sometimes seriously increase overhead costs. To offset this situation, the OSD Cost Analysis Improvement Group (CAIG) will collect data and assist in improving forecasting.

Improve Industrial Productivity

The third major thrust of the acquisition improvement actions is to improve industrial productivity. Note at the outset, however, that this is a small piece of a much larger activity in the Department of Defense. The Department of Defense has prepared a plan, entitled "Action Plan for Improvement on Industrial Responsiveness." which is designed to significantly strengthen the industrial base. A tri-service committee has been established to implement numerous action items within this plan. The stated objectives of this plan are to:

—Enable American industry to undertake a program of capital investment;

—Improve American self-sufficiency in the area of critical raw materials;

—Ensure sufficient skilled manpower exists to meet the demand of American industry;

—Improve the quality of American workmanship and products;

—Impose stability on military procurement programs and resource demands;

—Make the defense market an attractive place for Amerian industry to do business;

—Make military equipment designs compatible with commercial industrial production capabilities;

—Create an industrial base that is responsive to mobilization needs.

The increase in lead times illustrated in Figure 11-7 is just one indicator of the problems which the industrial base is facing. Note that the data in this chart reflect the mid-1980 time frame and that in recent months lead times have improved markedly. Nevertheless the data are significant reminders of the inability of the industry to cope with fluctuations in demand.

The fundamental thrust of the actions in this area is to create a favorable environment for capital investment by the industries. It is firmly believed that, with appropriate incentives, the industry will go a long way toward curing its own ills. The following actions address this area:

5. Encourage Capital Investment to Enhance Productivity.
3. Implement Multiyear Procurement.
32. Increase Competition.

Action 5 contains more than a half dozen specific actions which are designed to stimulate capital investment and ease cash flow problems. Some of these actions already have been accomlished; for example, progress payments have been accelerated, and the new tax law contains more liberal capital equipment depreciation provisions. Other actions, such as the initiative to repeal the Vinson-Trammell Act, are still in progress.

Action 5 also encourages the services to place increased emphasis on their manufacturing technology programs. These programs are, of course, already strongly supported by the services. It is worth noting in passing that it is entirely appropriate to pursue a manufacturing technology program in parallel with a RDT&E program.

Multiyear procurement, used when appropriate, has two advantages. On the one hand, it creates a

Figure 11-7
INCREASES IN LEAD TIMES

SYSTEM	1977 (MONTHS)	1980 (MONTHS)	DRIVERS
F-15	36	41	LANDING GEAR
F-16	28	42	SERVO ACTUATORS
A-10	29	49	LANDING GEAR
F100 ENGINE	19	37	FORGINGS
TF34 ENGINE	20	39	FORGINGS

SOURCE: REPORT OF THE DEFENSE SCIENCE BOARD 1980 SUMMER STUDY PANEL ON INDUSTRIAL RESPONSIVENESS, JANUARY 1981

secure climate in which contractors will more readily make capital equipment investments. On the other hand, it permits the contractor to buy materials and components in more economic lot sizes; a single buy can, for example, provide the requirements for an entire 5-year contract. It has been estimated that 10 to 15 percent can be saved through purchases of this sort.

The principal unresolved issue with respect to multiyear procurement is budgeting for the cancellation ceiling. The requirement to budget for cancellation ceilings would tie up substantial fractions on the total obligation authority (TOA) and would thus make multiyear procurement a less attractive option in most instances.

Mr. Carlucci added Action 32, Competition, to the original 31 actions on 27 July. The primary objectives of competition are to stimulate innovation (both in design and in manufacturing practice) and to stimulate investment. Provided the competition is effective (and not a pro forma square-filling exercise), the program manager potentially can realize both cost savings and risk reduction. At the same time, the industrial base is strengthened through investment in technology and in productivity. Needless to say, indiscriminate enforcement of competition leads to senseless expenditure of government *and* industrial funds. Thus the program manager must evaluate his opportunities for competition in terms of cost, potential for cost reduction, and risk reduction.

Increase Readiness

The fourth thrust of the actions to improve defense acquisition is to improve the readiness of systems in the field. Concerns in this area include the delayed entry of systems into the field, the delayed support of systems in the field, and the high cost of ownership once the systems have been fielded. The costs of ownership include the full spectrum of operational, maintenance, and support costs.

The central theme running through all five of the actions dealing with readiness was explictly stated in Action 1, Management Principles:

> Improved readiness is a primary objective of the acquisition process, of comparable importance to reduced unit cost or reduced acquisition time. Resources to achieve readiness will receive the same emphasis as those required to achieve schedule or performance objectives.

The five actions listed below single-mindedly echo this theme:

9. Improve System Support and Readiness.
31. Improve Reliability and Support for Shortened Acquisition Cycles.
21. Develop and Use Standard Operational and Support Systems.
16. Provide Contractor Incentives to Improve Reliability and Support.
30. Increase Program Manager Visibility of Support Resources.

It has, of course, been recognized for many years that a weapon system can be designed to incorporate features which facilitate its supportability and increase its readiness. A case in point is the F-18 aircraft. Moreover, since the vast majority of weapon system costs are determined by decisions that are made very early in the program, it is vitally important to consider logistics at the earliest possible moment in the program.

For those reasons, Secretary Weinberger and Deputy Secretary Carlucci felt that it was necessary to challenge the program manager in the stiffest possible terms. The reader is encouraged to study Actions 9 and 31 particularly.

(1) The program manager must define the readiness objectives for the system as early as possible and must be prepared to defend these objectives at the Requirement Validation milestone review. The readiness objectives of concern at this point go far beyond the normal items such as mean time between failure (MTBF), and address real system capabilities such as the ability to generate sorties.

(2) The program manager must design reliability and supportability into his weapon system and explicitly earmark resources early in the weapon system program to support these design efforts. The ultimate objective is to conserve the funds needed to support the system after it has been fielded.

(3) Particularly in the case of "fast-track" programs, the program manager must examine the feasibility and potential payoff of concurrent development and testing phases.

(4) The program manager must begin the iterative testing-design phases early in the program so that the system can mature in an orderly manner.

(5) The services are encouraged to target selected force elements for major upgrades, which will make them significantly less dependent upon logistic tails. This, of course, entails even more RDT&E effort.

Action 21 echoes the well-known requirement that standard operational and support systems be used. However, the emphasis of this action is on RDT&E of new standard systems and the associated technology. Items of particular interest in this group include both avionics equipment and test systems.

Action 16 specifically recognizes the validity of the use of contractual incentives as a technique for stimulating the contractor to pay more attention to reliability, maintainability, supportability, etc. The program manager should include logistics considerations among the source selection criteria, write specific incentives into the contract itself, and consider the use (where appropriate) of instruments such as reliability improvement warranties (RIWs). In the F-16 program, for example, nine separate items are covered by RIWs, and two items have mean-time-between-failure guarantees.

One last item deserves special mention: Action 30 recognizes that, because of the nature of the PPBS process, the program manager can sometimes be unaware of logistics decisions that directly impact the support of the system he is developing. In an attempt to ease this difficulty, both the OSD and the services are developing and implementing procedures which will give the program manager more visibility into resource decisions relating to his support assets.

Reduce Administrative Overhead Cost and Time

The fifth and final thrust of the actions to improve defense acquisition is to attack those legal requirements and administrative arrangements which add time and cost to the acquisition of weapon systems. The concerns include overmanagement at all levels of the government, the overall impact of government constraints, both administrative and legislative, and the impact of various outdated laws, directives, instructions, and regulations.

The following three actions provide an umbrella for a series of specific initiatives:

13. Reduce Governmental Legislation Related to Acquisition.
14. Reduce the Number of DOD Directives.
10. Reduce the Administrative Cost and Time to Procure Items.

Action 13 is designed to reduce the impact of excessively burdensome legislative programs. At the outset, it must be admitted that each legislative action that affects the acquisition process has its own appropriate goal. However, it has been possible to identify some legislative requirements whose goals are no longer particularly appropriate, and to identify some other legislative requirements whose impact on the defense acquisition process is much more severe than the benefits accrued as the result of the legislative action. It has therefore been possible to identify several target legislative measures. For example, in the view of many people, the statutory limitation on fees for cost-plus-fixed-fee contracts is outmoded and should be eliminated.

In some cases, we simply "do it to ourselves." A classic example is the growth of DOD directives and instructions. It has been 10 years since the last purge of directives and instructions, which reduced the number of such documents from 140 to 69. Now, with the number of directives and instructions again approaching 140, the process has begun once again by the direction of Mr. Carlucci. In addition, in an effort to hold down the number of directives and instructions in the future, the Defense Acquisition Executive has been designated as the sole issuer of future DOD directives related to acquisition.

Action 10 deals with raising the thresholds for various administrative actions. Most of these thresholds were established many years ago and have not kept pace with inflation. As a specific case in point, Action 10 seeks to raise the reprogramming thresholds from $2 million to $10 million for RDT&E appropriations and from $5 million to $25 million for procurement

Figure 11-8
SCORE CARD

NOTE:
SINCE COME ACTIONS HAVE SEVERAL PARTS. THEY MAY HAVE X'S IN TWO OR EVEN ALL THREE COLUMNS.

	ACCOMPLISHED	IN PM'S COURT	IN PROGRESS
CONTROLLED DECENTRALIZATION AND PARTICIPATIVE MANAGEMENT	5	1	1
PLANNING AND EXECUTION	2	9	3
INDUSTRIAL BASE	1	3	2
READINESS	—	4	1
ADMINISTRATIVE OVERHEAD COST AND TIME	1	—	3
ACTIONS 1 AND 13	2	—	—

appropriations. An interesting innovation in the current action is the suggestion to tie the new thresholds to inflation. Action 10 also seeks to relieve the amount of paperwork and administrative overhead. For example, it encourages the use of Class determinations and findings (D&Fs), an action that is explicitly permitted by current directives but often frowned upon in practice.

Conclusion

This brings us to the conclusion; as we reflect back across the specific actions, we must keep in mind that they cannot be applied blindly to all programs. Indeed, by their very nature, these actions require that the program manager make trade-offs—make decisions among the many opportunities and challenges offered by these actions.

Figure 11-8 gives, in summary form, a status report on the implementation of the 32 actions to improve defense acquisition. With respect to the data displayed here, two observations are important. First, 11 of the Actions (or parts of them) have been accomplished; thus, significant steps have already been taken toward improving the acquisition process. Second, 17 of the actions are now in your court; in most cases, you—the program manager—are in the best position to determine whether each of these 17 actions is appropriate for your program. You—the program manager—have the opportunity to contribute significantly to the overall improvement of the acquisition process.

There are many implications both for the services and for the program managers. Perhaps most important as far as the services are concerned is the expectation that these actions will be endorsed by the services and that they will be passed down the chain of command to the program managers. There is the firm expectation that responsibility, authority, and accountability will be delegated to a much greater degree than is done today. There is the further expectation that the services will reduce the number of reporting and reviewing requirements, thus freeing the program managers to do other tasks implied by the acquisition improvement actions. Indeed, although the DOD can take the lead and can make the program manager's life a little bit easier, the Department of Defense must rely on the services to make the big impact on the environment within which the program manager operates.

In addition, Mr. Carlucci has placed a great deal of emphasis upon program stability, charged the services to develop realistic plans, and insisted that these plans be considered as contracts between the services and the Department of Defense.

The program manager, for his part, has a lot of things to think about. At the start, he is encouraged to tailor his acquisition strategy, and to put money "up-front" with the expectation that money spent up-

front will reduce the total cost of the acquisition. The program manager is asked to spend more time with realistic costing, and to encourage the contractors to do the same. The program manager should investigate the use of multiyear procurements to lend stability to his programs. The program manager should investigate the use of a wide variety of incentives both to encourage the strengthening of the industrial base and to encourage quality performance on the part of contractors. The program manager is encouraged to budget for risk, and told tacitly that these funds will not be held in jeopardy. The program manager is asked to examine the evolutionary introduction of new technology. And finally, the program manager is asked to put much more emphasis on integrated logistics support throughout the acquisition process. To help the program manager in these many tasks, he is promised increased financial flexibility in dealing with the uncertainties he is certain to encounter. He is promised that the load of reporting and reviewing and briefing will be reduced. And he is promised that the burdensome load of legislative and regulatory requirements will be reduced.

In some respects the Department of Defense Acquisition Improvement has created a new program management environment. One of the most obvious characteristics of this new environment is the insistence in many of the actions that additional funds be spent "up-front," with the expectation that the benefits will be reaped later in the life cycle of the weapon system. Many examples come to mind: front-end funding for test hardware, pre-planned product improvement, economic production rates, just to name a few. Even with the currently projected FY 82 DOD budget, there is no way that all the implied fiscal requirements can be met. The implication is clear: High-priority programs will receive strong support, and low-priority programs will be cut. The measure of our management ability will be our ability to make the tough decisions this implies.

As we try to characterize this new environment further, several key words come to mind.

The program manager will have greater *authority* and *responsibility* in the new environment, and will have more *flexibility* to deal with the uncertainties he is certain to encounter. As the same time, a great deal is expected of the program manager and he will be held *accountable* for his actions. Indeed, his credibility and the credibility of his program will be gauged by how well he makes his decisions.

Credibility is crucially important in the larger context as well. It is vitally important that we in the DOD reestablish our credibility in the view of Congress and in the view of our industrial counterparts. To do this, we must demonstrate both the *commitment* and the *discipline* to manage our programs well. We must erase the image that DOD programs are out of control.

There is a tremendous amount of *excitement* about the 32 actions. This excitement is engendered in part by the fact that the services have been involved in the development of the actions from the first day. Thus, even the generation of the actions illustrates the participative management that Mr. Carlucci is seeking. The excitement also stems from the realization that, for the first time in many years, some real changes in the acquisition process may be possible. And, the excitement stems from the realization that the Department of Defense, beginning with Secretary Weinberger, Deputy Secretary Carlucci, and others, is absolutely committed to the implementation of these actions. And finally, there is the *urgency* I referred to in the introduction to this paper. As noted earlier, it will be necessary to have a large infusion of money right now in order to accomplish many of these actions. The FY 82 budget provides such a large infusion of money. Inasmuch as this could possibly be a singular event in time, it is imperative that these actions be pursued with utmost vigor and *urgency* at this time. The net result will be significant enhancement of our preparedness.

Footnotes

1. Shortly before the Joint Commander signed this guide, the Deputy Secretary of Defense, Frank C. Carlucci signed DOD Directive 5000.1 on 29 March 1982. Also, on 12 April 1982, the Under Secretary of Defense, Research and Engineering, Richard D. DeLauer, promulgated by memorandum major defense system acquisition program documentation format. Because of the close proximity of these events, the policy and requirements of these documents may not be fully included in this guide. Accordingly, the reader should seek additional guidance from these source documents.

APPENDIX A

Memorandum of Agreement on the Management of Multi-Service Systems/Programs/ Projects[1]

1. ***Purpose:***

This Memorandum establishes policies for implementing multi-service systems, program/project management in accordance with DOD Directive 5000.1, "Acquisition of Major Defense Systems," 13 July 1971. It is the basic policy document for management of multi-service systems, programs and projects, and the framework within which, like DOD Directive 5000.1, acquisition management procedures must operate.

2. ***Policy:***

The Service designated as the Executive Agent shall have the authority to manage the program/project under the policies and procedures used by that Service. The Program/Project Manager, the Program/Project Management Office, and, in turn, the functional elements of each Participating Service will operate under the policies, procedures, data, standards, specifications, criteria and financial accounting of the Executive Service. Exceptions, as a general rule, will be limited to those where prior mutual agreement exists or those essential to satisfy the substantive needs of the Participating Services. This may require the Participating Services to accept certain deviations from their policies and procedures so as to accommodate the assumption of full program/project responsibility by the Executive Service. Demands for formal reporting as well as nonrecurring needs for information will be kept to a minimum.

3. ***Responsibilities***

a. The Executive Service will:

(1) Assign the Program/Project Manager.

(2) Establish an official manning document for the Program/Project Management Office which will incorporate the positions to be occupied by representatives of the Participating Services, e.g., Department of the Army Table of Distribution and Allowances (TDA)/Department of the Navy Manpower Listing/Department of the Air Force Unit Detail Listing (UDL). The manning document developed from the Joint Operating Procedure on Staffing will also designate a key position for occupancy by the Senior Representative from each of the Participating Services.

(3) Staff the Program/Project Management Office with the exception of the positions identified on the manning document for occupancy by personnel to be provided by the Participating Services. Integrate the Participating Service personnel into the Program/Project Management Office.

(4) Be responsible for the administratiave support of the Program/Project Management Office.

(5) Delineate functional tasks to be accomplished by all participants.

b. The Participating Services will:

(1) Assign personnel to the Program/Project Management Office to fill identified positions on the manning document and to assist the Program/Project Manager in satisfying the requirements of all participants. Numbers, qualifications and specific duty assignments of personnel to be initially provided by each Participating Service will be reflected in the Joint Operating Procedure.

(2) The Senior Representative from each Participating Service will be assigned to a key position in the Program/Project Management Office and report directly to, or have direct access to, the Program/Project Manager. This key position could include assignment as Deputy to Program/Project Manager. He will function as his Service's representative, with responsibilities and authorities as out-

lined in Paragraph 3.d of this Agreement.

(3) Provide travel funds and support necessary for the accomplishment of the responsibilities of their representatives in the management of the Program/Project.

(4) Accomplish Program/Project functional tasks as specifically assigned in the Charter, in the Master Plan, and Joint Operating Procedures (JOPs), or as requested and accepted during the course of the Program/Project.

c. The Program/Project Manager will:

(1) Satisfy the specific operational, support and status reporting requirements of all Participating Services.

(2) Be responsible for planning, controlling, coordinating, organizing and directing the validation, development, production, procurement and financial management of the Program/Project.

(3) Review, on a continuing basis, the adequacy of resources assigned.

(4) Assure that planning is accomplished by the organizations responsible for the complementary functions of logistics support, personnel training, operational testing, military construction and other facilities, activation or deployment.

(5) Refer to the appropriate authority those matters that require decisions by higher echelons. The following items will be referred to appropriate authority:

(a) Deviations from the established Executive Service policy except as specifically authorized by the Program/Project documentation (reference Paragraph 4 below).

(b) Increases in funding of the Program/Project:

(c) Changes to milestones established by higher authority.

(d) Program/Project changes degrading mission performance or altering operational characteristics.

d. Participating Service Senior Representative(s) within the Program/Project Management Office will:

(1) Speak for his parent Service in all matters subject to the limitations prescribed by his Service. Authority of the Service Senior Representative is subject to the same limitations listed above for the Program/Project Manager.

(2) Refer to his parent Service those matters which require decisions by higher echelons.

4. *Documentation*

Management for particular Multi-Service Program/Projects shall be documented by:

a. *A Multi-Service Program/Project Manager Charter.* The responsible Commander in the Service having principal Program/Project management responsibility will cause the preparation, negotiation and issuance of a jointly approved Charter which will identify the Program/Project Manager and establish his management office. The Charter will define his mission responsibility, authority and major functions, and describe his relationships with other organizations which will use and/or support the Program/Project. The Charter will describe and assign responsibility for satisfying peculiar management requirements of Participating Services which are to be met in the Program/Project, and will be jointly approved for the Headquarters of each involved Service by persons officially appointed to approve such Charters.

b. *A Program/Project Master Plan.* This is the document developed and issued by the Program/Project Manager which shows the integrated time-phased tasks and resources required to accomplish the tasks specified in the approved statement of need/performance requirements. The plan will be jointly approved for each involved Service by persons officially appointed to approved such plans.

c. *Joint Operating Procedures (JOPs).* These will identify and describe detailed procedures and interactions necessary to carry out significant aspects of the Program/Project. Subjects for JOPs may include Systems Engineering, Personnel Staffing, Reliability, Survivability, Vulnerability, Maintainability, Production, Management Controls and Reporting (including SAR), Financial Control, Test and Evaluation, Training, Logistics Support, Procurement and Deployment. The JOPs will be developed and negotiated by the Program/Project Manager and the Senior Representatives from the Participating Services. An optional format is suggested in Attachment 1 to this Agreement. This action will be initiated as soon as possible and accomplished not later than 180 days after promulgation of the Multi-Service Program/Project Manager Charter. Unresolved issues will be reported to the Charter approving authorities for resolution.

d. *Coordination/Communication.* Where Participating Services are affected, significant program action, contractual, or otherwise, will not be taken by the Program/Project Manager without full consultation and coordination with the Participating Services while the matter is still in the planning stage. All formal communications from the Program/Project Management Office to higher authority in the Executive or Participating Services will be signed by the Program/Project Manager or his designated representa-

tive. Substantive change to the Charter, Master Plan, or JOPs will be negotiated with affected Participating Services prior to issuance as an approved change. No restrictions will be placed on direct two-way communications required for the prosecution of the Program/Project work effort, other than that required for security purposes.

1 Atch
JOP Format

We approve this Memorandum of Agreement and its implementing regulation.

/s/ HENRY A. MILEY, JR.
General, USA
Commanding General
US Army Materiel Command

/s/ I. C. KIDD, JR.
Admiral, USN
Chief of Naval Material
Naval Material Command

/s/ JACK J. CATTON
General, USAF
Commander
Air Force Logistics Command

/s/ GEORGE S. BROWN
General, USAF
Commander
Air Force Systems Command

20 July 1973

1. This memorandum of agreement is published as a joint regulation, AFLC/AFSC R 800-2.AMCR 70-59/NAVMATINST 5000.10A.

Joint AMC/NMC/AFLC/AFSC Operating Procedure for

I. INTRODUCTION:
This paragraph is intended to give a description and a brief review of the functional area of interest including why the JOP is necessary. Outline briefly the overall requirement which needs fulfillment.

II. SCOPE:
The scope will outline the various phases of the Program/Project and tie down the overall limits of the functional area of interest in terms of time and any special provisions or limitations.

III. REFERENCES:
Include all applicable AMC/NMC/AFLC/AFSC regulations, directives, etc., that are pertinent to the functional area of interest.

IV. RESPONSIBILITIES:
This paragraph is intended to identify the relationships and responsible entities such as who has the overall management responsibility and who has the support responsibility. In addition, this paragraph should describe what the "product" or the effort should be.

V. PROCEDURES:
This paragraph should define the work to be accomplished and indicate the main steps of action, including coordination, which are required to conduct the tasks involved properly in developing the functional area of interest.

APPROVAL:

Senior Representative Participating Service	Program/Project Manager Executive Service

Attachment 1

APPENDIX B
Charter for the Joint Project Manager For Advanced Tactical Aircraft Protection Systems (ATAPS) (PMA272)

1. ***General***

a. The purpose of this charter is to establish and promulgate the mission, authority and responsibility of the Advanced Tactical Aircraft Protection Systems (ATAPS) Project Manager. It also provides for the Project's scope, operating relationships, organization and resources, and delineates the framework for joint Navy/Air Force participation in the development and acquisition of systems assigned. Air Force participation in ATAPS is limited to those efforts covered by specific memoranda of agreement. The Chief of Naval Material assigned executive management responsibility to the Commander, Naval Air Systems Command. The Commander, Naval Electronic Systems Command management responsibility is set forth in the applicable memorandum of agreement.

b. The following memoranda of agreement are applicable to the ATAPS Project and form the authoritive basis for this charter.

(1) Memorandum of Agreement on the Management of Multi-Service Systems/Programs/Projects, dated 20 July 1973. Signatories: CG, U.S. Army Material Command, Chief of Naval Material; Commander, Air Force Logistics Command; and Commander, Air Force Systems Command.

(2) Memorandum of Agreement for the Engineering Development Phase One of the Airborne Self Protection Jammer (ASPJ) Electronic Warfare System, dated 2 October 1978. Signatories: For the Chief of Naval Operations; Director, Tactical Air Surface and Electronic Warfare Development Division (OP-982). For the Chief of Staff U.S. Air Force; Director, Operational Requirements, DCS/Research and Development. (Note: This MOA is in the process of being revised to include added Air Force program scope and incorporate Phase Two of the Full Scale Development Program.)

(3) Memorandum of Agreement for the Supervision and Support of the ASPJ Program, dated 4 May 1979. Signatories: Commander, Naval Air Systems Command, and Commander, Naval Electronic Systems Command.

2. ***System Description.***

The principal developments in the ATAPS Project are the ASPJ and the ALQ-131 Comprehensive Power Management System (CPMS). The ASPJ is a modular, low cost, lightweight, electronic warfare suite for Navy and Air Force tactical attack and fighter aircraft. It will provide F/A-18, F-14, F-16 and other designated aircraft with a wide band capability to interrupt or deceive modern diversified radar controlled anti-aircraft weapons systems. The CPMS is a receiver/controller system composed primarily of modules common to the ASPJ. The CPMS is designed to improve the performance of the ALQ-131 Pod.

3. ***Mission/Scope***

a. The Project Manager's primary mission is to provide the operating forces of the Navy and the Air Force fully developed, common, supportable and reliable systems which will satisfy approved operational requirements. In addition, he will manage the acquisition and support of Foreign Military Sales (FMS) or other Defense security assistance programs.

b. The scope of the ATAPS Project consists of the definition, development, test and evaluation, acquisition and logistics support of the system.

4. ***Project Management***

a. The ATAPS Project will be planned, organized, and controlled by a designated joint service Project Office. This Project Office will be responsive to the requirements of the Navy and Air Force and will be the single point of contact for all official actions within the services and with industry during the development and production phases of the project. Appendix A depicts the organizational relationships of the project.

b. The ATAPS Project Office will be administratively staffed and supported in accordance with the provisions set forth in the current memorandum of agreement.

c. Funding. The applicable Navy program element is PE 64226N which is dedicated to the ASPJ development. Air Force funding is provided to the

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Naval Air Systems Command through Air Force Program Element, PE 64737F. Air Force funds are administered in accordance with NAVAIRINST 7020.2A.

d. Captain W. G. Carlson, USN, is the ATAPS Project Manager. He will be the single official point of contact and spokesman for the DOD on all assigned matters related to the ATAPS Project.

e. An Air Force officer will be assigned as the ATAPS Assistant Project Manager and in this capacity is second in charge of the project. He also functions as the ATAPS principal management representative for Air Force programs. He will be located in the ATAPS Project Office and will assist the ATAPS Project Manager in the management of the ATAPS Project Efforts and participate in all actions affecting these efforts including the management of the Project Office staff. He will be the Air Force representative for the Air Force unique portion of the project, including responsibility for incorporation of all Air Force requirements in the project; and the negotiation and coordination leading to final approval of joint operating procedures needed to satisfy the substantive needs of the Air Force.

f. Functional assistant project managers in the matrix organizations of the cognizant systems commands will be assigned to the project, as required. Air Force deputy project managers will be assigned as required (i.e., Deputy Project Manager, Logistics, with duties and responsibilities as specified in the Joint Service Memorandum of Agreement, Deputy Project Manager, Test, etc.). Appendix B illustrates the organization of the ATAPS Project Office.

g. Naval laboratories, weapons and test centers, and Air Force units will provide technical and development support under the direction of the functional assistant project managers or representatives of the Air Force as appropriate. See Appendix C for a list of activities participating in the project.

h. The ATAPS Project Manager will be fully supported by the functional organizations of the Naval Air Systems Command and the Naval Electronic Systems Command in accordance with the current memorandum of agreement. Representatives of these organizations will be assigned as members of the Project Manager's team and will plan and implement project efforts under the direction of the Project Manager. When conflicts between project and functional policies and objectives develop that cannot be resolved, the matter will be referred to the appropriate level of authority for resolution. Actions directed by the Project Manager, however, shall be instituted during the period pending resolution.

5. ***Specific Authority and Responsibilities of the Project Manager***

a. The ATAPS Project Manager is the single central executive responsible for the successful management of the project and accomplishment of the objectives in this charter. He has broad directive authority within the scope of the project over the planning, direction, control, and utilization of resources of the approved project to meet Navy/Air force requirements and assignment of responsibilities, as appropriate, to the various systems commands functional organizational elements. As the responsible executive, he is expected to act on his own initiative in matters affecting the project. In those cases where action is required beyond the authority granted in this charter, he shall refer the action to appropriate higher authority in his Department of the Navy and/or the Department of the Air Force with his recommendations, including available alternatives.

b. The ATAPS Project Manager shall have the specific authority and responsibility to:

(1) Plan, organize and administer the Project Office.

(2) Make the business and technical management decisions authorized by the project charter and required for successful project completion.

(3) Establish detailed initial and long-range project objectives in compliance with the formally established requirements of the Navy and Air Force.

(4) As appropriate, direct the management of test, engineering and analytical studies required in compliance with formally established requirements of the Navy and Air Force.

(5) Manage the accomplishment of the design, development, test, production and support phases. Make necessary arrangements for technical evaluations and furnish such assistance as may be required in these evaluations.

(6) Ensure coordination of work efforts of the Navy and Air Force activities and contractors for the project to prevent unnecessary duplication of effort.

(7) Approve the Navy and Air Force funding estimates prior to incorporation in the project budget for Five Year Defense Program elements (or parts thereof) predominatly identified with the project.

(8) Direct the preparation, submission, and maintenance of Decision Coordinating Paper 171 (DCP 171) in compliance with DOD Directives and implement Navy and Air Force procedural documents as appropriate. The DCP 171 includes Navy and Air Force requirements.

(9) Exercise financial management control of the utilization of all Navy and Air Force funds as-

signed for the execution of the project in accordance with DOD directives, and appropriate Joint Operating Procedures. (See paragraph 6c for additional information concerning Joint Operating Procedures.) Air Force unique efforts contracted for by Air Force agencies are excluded from the ATAPS Project Manager's financial management control.

(10) Define the work efforts to be undertaken by contractors and Navy and Air Force activities for the project, and approve the proposed plans for execution, scope and schedule of work, and the costs of work efforts requiring project funds. The ATAPS Project Manager may delineate the degree of engineering and test cognizance to be exercised within the framework prescribed in appropriate Joint Operating Procedures.

(11) Furnish such Navy and Air Force related information and requirements as may be necessary for effective procurement planning and contract negotiations; and approve, consistent with Defense Acquisition Regulations (DAR) and effective Navy procurement directives, all proposed contractual actions to be taken to satisfy requirements. The contracting officer will assist the Project Manager and keep him advised of required procurement planning and other contractual matters.

(12) Establish and promulgate design interface specifications for ATAPS system integration.

(13) Coordinate appropriate interface segments of the project with appropriate commands of the Air Force and with other project managers, project coordinators, systems commands, and Naval Material Command staff elements to ensure a totally coordinated Navy/Air Force effort. Furnish necessary ATAPS project data required by the aircraft systems project managers to ensure proper integration and compatibility of the completed systems with the service platforms. Development, procurement, and support of ATAPS related equipment peculiar to service platform needs such as mounting hardware, cabling, and waveguide configurations are the responsibility of the aircraft systems project managers. Interface problems not resolved shall be referred directly to the appropriate senior management official within the Naval Material Command and additionally to the Air Force Systems Command/Air Force Logistics Command in the event the problem involves an Air Force system interface. Specific interface requirements may be covered in appropriate Joint Operating Procedures.

(14) Establish and promulgate criteria for contractor test, evaluation, and installation of systems, subsystems, components, equipment, and devices as appropriate.

(15) Ensure that required Ground Support Equipment (GSE) and test equipment are developed and procured in time for concurrent delivery with the prime equipment. This includes purchasing unique ASPJ and CPMS support equipment where this equipment is produced by the prime ASPJ/CPMS contractors. When required, provide advice, guidance, and assistance to participating organizations on common GSE and test equipment in order that they may plan, procure, and effect timely deliveries of such equipment in support of project deliveries. Procedures to carry out the foregoing may be prescribed in an appropriate Joint Operating Procedure.

(16) Ensure the development, maintenance, and execution of Integrated Logistics Support Plans for the project in compliance with current DOD directives, NAVMATINST 4000.20B and applicable Joint Operating Procedures. Plans will include all Navy and Air Force logistics support requirements for the project as appropriate.

(17) Exercise overall configuration management of the ATAPS in accordance with formal requirements. Establish appropriate methods and procedures to implement configuration control in compliance with DOD directives, NAVMATINST 4130.1A and appropriate NAVAIR instructions. Joint Operating Procedures for ATAPS may be established as required to augment Navy procedures and assure provision of essential data required by the Air Force.

(18) Ensure that quality assurance, reliability, maintainability, vulnerability, safety, value engineering, electromagnetic compatibility, human factors and environmental impact aspects of the project comply with DOD directives and implementing instructions.

(19) Ensure that all technical documentation (including, but not limited to, drawings, illustrated parts breakdowns, and technical manuals), regardless of source, is prepared in compliance with current Navy instructions and applicable USAF directives, and is available in usable form in time to satisfy the informational needs of training, operating and maintenance personnel. All technical documentation shall be available for appropriate delivery with the system, subsystem, components, and equipments. This requirement also includes the technical documentation for ground handling, test and support equipment in compliance with DOD data management directives and implementing Navy instructions. These requirements may be included in appropriate Joint Operating Procedures.

(20) When appropriate, direct the procurement of required Navy training devices and equipments,

and the Air Force equivalents of such equipments, including spares and spare parts. Ensure that training plans are developed by cognizant activities to provide the required integrated training plans for Navy and Air Force instructors and operating and maintenance personnel. These requirements may be included in an appropriate Joint Operating Procedure.

(21) Ensure analysis of system, subsystem, and component performance in relation to the required performance specifications, and direct corrective action when appropriate.

(22) Establish necessary management control techniques and procedures to provide accurate and comprehensive information concerning the status and progress of the project as required by higher authority. Require participating organizations to keep him advised of the status and progress of project work efforts under their cognizance. Use existing management systems, procedures, and reporting systems to the maximum extent possible, supplemented as necessary with USAF management procedures to support peculiar Air Force needs. When required, on a case-by-case basis, provide advice, guidance, and assistance to participating organizations in support of the Cost Information Reports System.

(23) Furnish necessary project data required by the Air Force, naval systems commands, project managers, or Navy higher authorities for preparation of consolidated reports on selected categories of hardware.

(24) Report current status and progress of the project to appropriate Navy and Air Force departmental officials through the chain of command with particular emphasis on bringing to the attention of top management any current problems which will appreciably affect present or future project status, scheduled milestones, system performance, or costs.

(25) Furnish to all participating activities current information on project plans and proposed changes in order that such activities may update and keep current their detailed plans for functions for which they have responsibility.

(26) Issue, under his own authority, such correspondence, technical directives, management plans and project directives as may be necessary to ensure that plans, budgets, allocations, and schedules in support of the project are properly integrated and time phased. Ensure that all approved correspondence or instructions to contractors affecting the terms or conditions of contracts are in writing and signed by the appropriate contracting officer.

(27) Ensure joint participation by Navy/Air Force representatives in technical and management decisions relating to ATAPS.

(28) Ensure compliance with the Secretary of Defense and the Secretary of the Navy current proposal evaluation and source selection policies.

(29) When appropriate, establish requirements for, and monitor the acquisition of, special or additional facilities necessary for the support of test, evaluation, installation, operation, and maintenance of ATAPS and supporting devices. Ensure that the requirements for new facilities and for modifications to existing facilities are made known to appropriate services so that planning, programming, and construction schedules will be responsive to support of the ATAPS.

(30) The ATAPS Project Manager will ensure that necessary security regulations to safeguard classified material are instituted in accordance with the U.S. Navy Security Manual. He will disseminate appropriate security classification guidelines for the project. Decisions related to security problems and the administration of security matters will be provided by the Naval Air Systems Command.

(31) The ATAPS Project Manager is authorized to prepare and sign fitness reports for all military personnel assigned full-time to the Project Office, and execute performance evaluations as applicable for Navy civilian personnel assigned full-time to that office. He shall submit concurrent fitness reports on other officers junior to him, and concurrent evaluations on Naval Material Command civilian employees working for him in matrix management under the authority of this charter. Effectiveness report/efficiency rating procedures for Air Force personnel assigned to the project are provided in the joint ASD/NAVAIR/AFALS Memorandum of Agreement.

(32) The ATAPS Project Manager shall maintain a continuing review of operational requirements, including inventory objectives, established by higher authority for his project to ensure timeliness, accuracy, consistency, and compatibility. When inconsistent and incompatible requirements and objectives cannot be resolved by the Project Manager, the problems and recommendations shall be submitted in writing to the Commander, Naval Air Systems Command, and the Deputy Commander for Plans and Programs, or an appropriate higher authority for resolution.

(33) The ATAPS Project Manager shall maintain a continuing review of logistic support provided by participating organizations to ensure that such support is compatible with approved project and operating objectives. When deficiencies in such support cannot be resolved by the Project Manager, the prob-

lems and recommendations shall be submitted in writing to the Commander, Naval Air Systems Command and appropriate higher authorities for resolution.

c. The authority and responsibility of the ATAPS Project Manager or his staff shall not include:

(1) Deviations from established Navy and Air Force policies except as specifically waived.

(2) Approval of project thresholds.

(3) Final approval of procurement plans, acquisition strategy, decision coordinating paper or other top level documents governing the conduct of the project.

(4) Changes to the schedules established by higher authority for deliveries and operational use.

(5) Changes degrading mission performance or altering operational characteristics specified by higher authority.

(6) Authority to act as the ATAPS Contracting Officer in the execution of contracts or changes thereto.

d. The ATAPS Project Manager receives his authority from and is ultimately responsible and accountable to the Commander, Naval Air Systems Command for the discharge of the latter's responsibility relative to the project. He is authorized direct access to the Commander from whom he receives broad policy determination and requirements definition. For guidance and assistance, the Project Manager shall report to the Deputy Commander for Plans and Programs who exercises broad direction and life cycle management coordination over the project. Within the Naval Electronic Systems Command, he is assigned to the Manager, REWSON (Reconnaissance Electronic Warfare Special Operations NIPS (Naval Intelligence Processing Systems)) Systems Project (PME107) for centralized integration and coordination of the ATAPS Project with the total REWSON System Project. The ATAPS Project Manager will also keep the Deputy Commander for Plans and Programs informed of status, progress and problems related to this project.

e. The ATAPS Project Manager is authorized direct contact with all activities concerned with the project. Initially these contacts will be made through the cognizant Air Force command, the cognizant Naval Systems command, or appropriate management office. The ATAPS reporting authority, the Deputy Commander for Plans and Programs, will be informed of all nonroutine contacts.

6. ***Specific Interface and Operating Relationships***

a. Navy (*Requirements Applicable Only to Navy Internal Operating Relationships*). The ATAPS Project Manager will:

(1) Provide data relevant to Foreign Military Sales (FMS) case½assignments. When required by the recipient foreign country, the Project Manager will provide overall initiation, guidance, coordination, and review of United States contracts/Navy efforts in logistically supporting and sustaining in-country inventory of systems under his cognizance. The Project Manager also will maintain close liaison with a maximum responsiveness to the Defense Security Assistance Office (AIR-103), the Deputy Chief of Naval Material for Security Assistance (MAT-08F), and OPNAV (OP-63) on FMS matters.

(2) Maintain active liaison with cognizant members of the Naval Material Command staff and with the OPNAV Program Coordinator, OP-506G, in accordance with the Navy Programming Manual. The Project Manager shall keep the foregoing personnel fully informed of the status and progress of the project through formal and informal relationships.

(3) Coordinate project matters with other applicable project managers and project coordinators. Specifically, the ATAPS Project Manager is required to work closely with the airframe PMAs whose aircraft are designated to receive or are candidates for the ASPJ. These PMAs are PMA234 (A-6E/EA-6B), PMA241 (F-14), PMA257 (AV-8B), and PMA265 (F/A-18). In addition to the airframe PMAs, close contact must be maintained with PMA253 (REWS) to coordinate the overall Tactical Air Electronic Warfare Program and with PMA242 (Defense Suppression) to coordinate the lethal and nonlethal aspects of Defense Suppression. Liaison with Air Force commands and activities will be in accordance with the governing memorandum of agreement.

(4) Keep the Office of the Deputy Chief of Naval Operations (Manpower) (OP-01), Commander, Naval Material Command, and Headquarters, Marine Corps, fully informed of the military personnel requirements of the project. Personnel requirements normally will be transmitted to OP-01 and the Marine Corps through the Program Coordinator within the Office of the Deputy Chief of Naval Operations (AIR).

b. *Air Force.* Either the ATAPS Project Manager or the Air Force Assistant Project Manager will be responsible for coordinating ATAPS matters with various Air Force commands including, but not limited to, Headquarters, USAF; Air Force Systems Command; Air Force Logistics Command; Tactical Air Command; Air Training Command; and Air Force Test and Evaluation Center. Interactions usually will be effected by the Air Force Assistant Project

Manager.

c. *Joint Operating Procedures*

(1) Joint Operating Procedures may be negotiated and executed between the Navy and Air Force as required to clearly define the procedures to be followed by each service in meeting total ATAPS requirements. The areas listed below are candidate subjects for Joint Operating Procedures:

(a) Engineering and test cognizance
(b) Configuration management
(c) Procurement and production
(d) Integrated Logistics Support
(e) Financial management and status reporting (Project Control)
(f) Personnel subsystem including training
(g) Systems safety
(h) Data management
(i) Maintainability/reliability
(j) Administration
(k) Additional Joint Operating Procedures

(2) The Joint Operating Agreements appearing in the Standard Integrated Support Management System (SISMS) Manual, AFLCR/AFSCR 800-24, NAVMATINST 4000.38, AMCR 700-97, and MCOP 4110.1A dated 16 November 1978 will be used as the baseline where appropriate, for developing the Joint Operating Procedures for this project.

(3) The ATAPS Project Manager and his Air Force assistant are authorized to negotiate and direct execution of Joint Operating Procedures. Cognizant commands will assist in the negotiation and execution of these procedures and agreements.

7. *Logistics Organizations Furnishing Support to the Project*

a. The ATAPS Project Manager will be responsible for the procurement of initial quantities of spares and repair parts, test and special support equipment, technical documentation, trainers, training equipment, and devices for both the Navy and Air Force through the contractor and appropriate Navy logistic support activities.

b. The Deputy Program Manager for Logistics will manage the logistics and support activities on behalf of the ATAPS Project Manager and will coordinate and implement these activities for both Navy and Air Force requirements.

c. *Navy.* The Naval Air Systems Command and the Naval Supply Systems Command, through their commodity managers, will provide Navy follow-on replenishment support.

d. *Air Force.* The Air Force Logistics Command, through its Item Manager, will provide Air Force follow-on support.

8. *Organizations Performing Test, Demonstration, and Evaluation*

a. Contractor test and demonstrations will be performed in accordance with the terms of the original and follow-on contracts for specific systems. Operational tests and evaluations will be performed by each service to meet its own requirements. Coordinated testing will be conducted on items of mutual interest.

b. Various Navy/Air Force test and evaluation activities, as applicable, may be required to conduct flight and ground test of Navy and/or Air Force equipments. Funding support and requirements for the tests will be as prescribed in an appropriate Joint Operating Procedure.

c. The Deputy Program Manager for Test and Evaluation will manage the test activities on behalf of the ATAPS Project Manager and will coordinate and implement these activities for both Navy and Air Force requirements.

9. *Organizations Preparing Training Plans and Procuring Training Devices and Aids*

a. The ATAPS Project Manager may be required to coordinate Navy training requirements for instructors and maintenance personnel in accordance with plans approved by the Chief of Naval Operations.

b. The ATAPS Project Manager may be required to coordinate Air Force training requirements in accordance with plans approved by the Air Training Command. Implementation will be incorporated in an appropriate Joint Operating Procedure.

10. *Assignment and Assessment of Resources*

a. *Resources Assigned*

(1) *Funds.* Funds listed in current allocations are assigned to the ATAPS Project Manager for obligation in the execution of the project objectives. Air Force funds will be identified on MIPRs (Military Interdepartmental Purchase Requests) prepared by the Air Force. Reprogramming of ATAPS funds below threshold limits is not authorized except upon approval of the ATAPS Project Manager. In general, these funds will cover procurement of all material and services needed to satisfy Air Force ATAPS requirements.

(2) *Utilization of Activities.* Organizational elements participating in the project and performing tasks assigned by the Project Manager are listed in Appendix C. For activities under the Commander, Naval Air Systems Command and the Commander, Naval Electronic Systems Command, the Project Manager shall have the authority to assign tasks or to

direct the assignment of tasks. Requirements for tasks to be performed by the Air Force activities shall be coordinated by the Air Force Assistant Project Manager. For other activities, official correspondence will be utilized to request the assistance required.

(3) *Manpower.* The manpower resources currently required to staff and operate the ATAPS Project Office are identified in Appendix D. Periodically a review of manpower resources will be conducted.

(4) *Administrative Support.* The ATAPS Project Office will be administratively supported by the Naval Air Systems Command and the Naval Electronic Systems Command in accordance with the provision of the current NAVAIR/NAVELEX Memorandum of Agreement. This support will include, but not be limited to, Navy military personnel services, Navy civilian personnel services, space allocations, office services, security, graphic arts, communications, Navy travel, and contracting, as appropriate. The Naval Data Automation Command will provide administrative support for financial reporting services and computer services in accordance with established procedures. Travel support for Air Force personnel outside the ATAPS Project Office will be provided in accordance with Air Force procedures.

b. *Resources Assessment*

(1) The ATAPS Project Manager shall evaluate and document the effect of proposals to increase or decrease the resources authorized for the execution of the project and shall determine the effect of the proposed changes on approved cost, schedules, procurement plans, and performance activities. This evaluation shall be conducted in conjunction with the Air Force Assistant Project Manager on matters of concern to the Air force. The Project Manager's evaluation will be considered by officials having final decision authority during programming and budget deliverations.

(2) The Chief of Naval Operations and the Chief of Naval Material, and appropriate Air Force commands and headquarters, shall be informed through channels in any instance where the requirements of the Project cannot be met within the resources and time available.

11. *Operating Parameters*

Specific performance, supportability, funding, schedule constraints and thresholds are set forth in the current issue of DCP-171.

12. *Public Information*

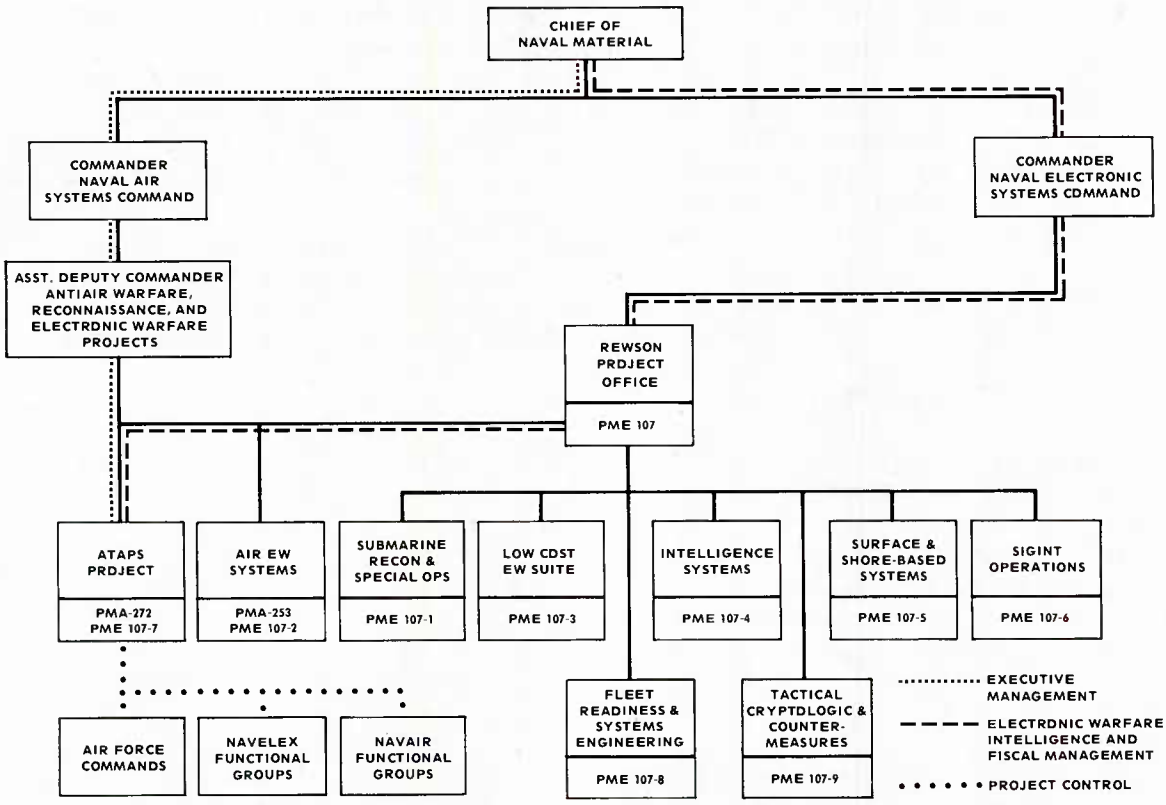
The Navy, as Executive Service, will be responsible for the coordination and dissemination of public information relating to ATAPS. The responsibility for provision of information to legislative bodies, industry and to the general public has been delegated to the Legislative and Information Office (AIR-00D).

13. *Project Withdrawal, Transition and Disestablishment*

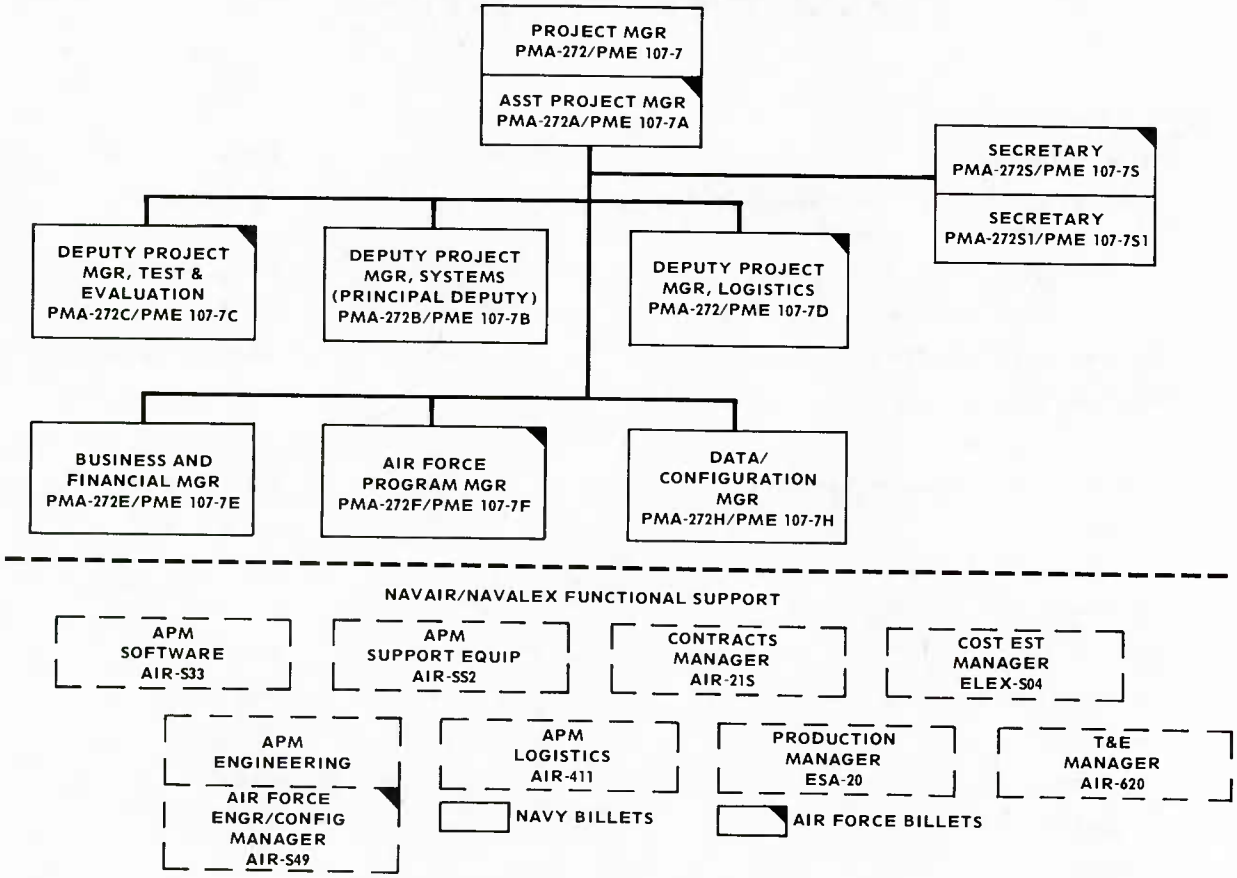
a. This project will be reviewed periodically to determine if it has accomplished its objectives. If the review indicates the objectives have been or are about to be accomplished, a transition plan shall be promulgated to insure a smooth disposition of remaining resources, responsibilities, and functions.

b. The withdrawal of either participating service from the production phases of the ATAPS Project shall be fully coordinated with the other service.

APPENDIX A
ORGANIZATIONAL RELATIONSHIPS



APPENDIX B
ATAPS PROJECT ORGANIZATION



APPENDIX C
ACTIVITIES PARTICIPATING IN PROJECT

Activity	Location
PRINCIPAL ACTIVITIES	
Naval Material Command	Washington, DC
Naval Air Systems Command	Washington, DC
Naval Electronic Systems Command	Washington, DC
Air Force Systems Command	Andrews AFB, MD
Air Force Logistics Command	Wright-Patterson AFB, OH
SUPPORT ACTIVITIES	
NAVY	
Naval Training Equipment Center	Orlando, FL
Navy Aviation Supply Office	Philadelphia, PA
Naval Research Laboratory	Washington, DC
Pacific Missile Test Center	Pt. Mugu, CA
Naval Air Test Center	Patuxent River, MD
AIR FORCE	
Aeronautical Systems Division	Wright-Patterson AFB, OH
Air Force Acquisition Logistics Division	Wright-Patterson AFB, OH
Air Force Test and Evaluation Center	Kirtland AFB, NM
Armament Division	Eglin AFB, FL
Hq. Air Training Command	Randolph AFB, TX
Hq. Tactical Air Command	Langley AFB, VA
Warner-Robins Air Logistics Center	Robins AFB, GA
Ogden Air Logistics Center	Hill AFB, UT

It is anticipated that additional activities may be required to participate in the execution of the ATAPS Project.

APPENDIX C
ENCLOSURE (1)

APPENDIX D
MANPOWER RESOURCES

Title	Source
ATAPS Project Office	
Project Manager	Navy (NAVAIR)
Assistant Project Manager and Deputy Project Manager, Air Force Program	Air Force
Deputy Project Manager, Systems	Navy (NAVELEX)
Deputy Project Manager, Test	Air Force
Configuration/Data Control Manager	Navy (NAVAIR)
Business/Financial Manager	Navy (NAVELEX)
Program Manager	Air Force
Deputy Project Manager, Logistics	Air Force
Secretary	Air Force
Secretary	Navy
NAVAIR Assistant Project Managers	
Contracting	AIR-215
Development (Technical and Systems)	AIR-5332
Logistics	Air-4112
T&E Coordination	AIR-620C
Production	ESA

APPENDIX D

ENCLOSURE (1)

APPENDIX C
Test and Evaluation Centers

ARMY

— The U.S. Army Operational Test and Evaluation Agency (OTEA) has the responsibility for the conduct of all U.S. Army major and Category I operational testing. OTEA has no testing facilities of their own and only a small staff. OTEA may manage or merely monitor tests at any of the sites listed below.

The Training and Doctrine Command (TRADOC) is responsible for all Category II and below and OTEA assigned systems operational testing, as well as concept evaluation testing, force development and training experimentation (FDTE), or any other user tests as may be prescribed to answer issues in doctrine, tactics, and operation. TRADOC agencies/commands/boards are as follows:

- — TRADOC Combined Army (TCATA), Ft. Hood, TX - large scale field experiments and operational testing up to corps size.
- — Combat Developments Experimentation Command (CDEC), Ft. Ord, CA - small scale, high resolution, highly instrumented tests of small units (company size and below).
- — U.S. Army Aviation Board, Ft. Rucker, AL
- — U.S. Army Armor and Engineering Board, Ft. Knox, KY
- — U.S. Army Air Defense Board, Ft. Bliss, TX
- — U.S. Army Airborne Board, Ft. Bragg, NC
- — U.S. Army Communications/Electronics Board, Ft. Gordon, GA
- — U.S. Army Field Artillery Board, Ft. Sill, OK
- — U.S. Army Infantry Board, Ft. Benning, GA
- — U.S. Army Intelligence and Security Board, Ft. Huachuca, AZ

— *U.S. Army Test and Evaluation Command (TECOM).* Headquartered at the Aberdeen Proving Ground, Maryland. TECOM is the primary developmental test agency for the Army. Activities and installations of TECOM include:

- — Aberdeen Proving Ground, Maryland - testing of all weapons (except nuclear weapons) and wheeled and tracked vehicles.
- — Cold Regions Test Center, Fort Greely, Alaska - environmental testing of all types of material under extreme conditions
- — U.S. Army Aircraft Development Test Activity, Fort Rucker, Alabama - testing of aircraft components and aircraft support equipment
- — U.S. Army Dugway Proving Ground, Utah - testing of chemical and radiological defense material and systems
- — Electronic Proving Ground, Fort Huachuca, Arizona - testing of communications and electronic equipment
- — Jefferson Proving Ground, Indiana - testing of ammunition
- — White Sands Missile Range, New Mexico - testing of missiles, missile systems and space systems
- — Tropic Test Center, Panama - environmental testing of all types of material and equipment
- — Yuma Proving Ground, Arizona - environmental and general testing of weapons, munitions and automotive systems and equipment
- — Kwajalein Missile Range, Pacific - testing of missiles, missile systems and space systems

— *U.S. Army Material Systems Analysis Activity (AMSAA).* Also at the Aberdeen Proving Grounds. AMSAA provides the central independent materiel and weapons effectiveness studies and analyses for the Army Material Development and Readiness Command (DARCOM). AMSAA also performs reliability, availability, and maintainability studies, and independent evaluations of development tests conducted by other DARCOM test activities.

— Laboratories and test centers of each of the individual product-oriented Research and Development Commands:

- — Armament; Aberdeen, Maryland and Ft. Picatinny, New Jersey
- — Aviation; St. Louis, Missouri
- — Communications; Ft. Monmouth, New Jersey

- Mobility Equipment; Fort Belvoir, Virginia
- Missiles; Redstone Arsenal, Alabama
- Tank-Automotive; Warren, Michigan
- Electronics; Adelphi, Maryland
- Food, Tools, Support Equipment; Natick, Masachusetts

NAVY

- *Naval Research Laboratory (NRL).* Located at Washington, D.C., NRL functions as the corporate research laboratory of the Navy in a broadly based multi-disciplinary program of scientific research and advanced technological development.
- *Naval Air Development Center (NADC).* NADC, at Warmister, Pennsylvania is the principal RDT&E center for naval aircraft systems.
- *Naval Coastal Systems Laboratory (NCSL).* Located at Panama City, Florida, NSCL is the principal RDT&E center for the application of science and technology associated with military operations executed in coastal regions.
- *David Taylor Naval Ship Research and Development Center (DTNSRDC).* Headquartered and principally located in Bethesda (Carderock), Maryland, DTNSRDC is the principal RDT&E center for naval vehicles and provides RDT&E support for the U.S. maritime industry.
- *Naval Surface Weapons Center (NSWC).* Headquartered at Silver Spring (White Oak), Maryland, with additional facilities at Dahlgren, Virginia, NSWC is the principal RDT&E center for naval surface warfare weapons systems.
- *Naval Undersea Center (NUC).* NUC at San Diego, California, is the principal RDT&E center for undersea surveillance and advanced undersea weapons.
- *Naval Underwater Systems Center (NUSC).* With headquarters at Newport, Rhode Island, and facilities there and at New London, Connecticut, NUSC is the principal RDT&E center for underwater weapons systems.
- *Naval Weapons Center (NWC).* NWC at China Lake, California, is the principal Navy RDT&E center for air warfare and missile systems.
- *Atlantic Underseas Test and Evaluation Center (AUTEC).* Headquartered at West Palm Beach, Florida, with facilities in the Caribbean Sea, AUTEC provides a deepwater test and evaluation facility for ship, sensor, and underwater weapons systems.
- *Naval Air Engineering Center (NAEC).* The NAEC at Lakehurst, New Jersey, conducts RDT&E for aircraft launching and recovery support systems and ground support equipment.
- *Naval Air Propulsion Center (NAPC).* Located in Trenton, New Jersey, NATPC tests and evaluates aircraft propulsion systems.
- *Naval Air Test Center (NATC).* The NATC at Patuxent, Maryland, performs T&E of aircraft and weapons systems and ground support equipment.
- *Atlantic Fleet Weapons Training Facility (AFWTF).* Headquartered at Roosevelt Roads, Puerto Rico, and with facilities spread throughout the Caribbean area, AFWTF supports development and testing of ship and air weapons systems and fleet training.
- *Pacific Missile Test Center (PMTC).* Headquartered at Point Mugu, California, PMTC provides range facilities and support for RDT&E of DOD missile, satellite and space vehicle programs.
- *Naval Weapons Evaluation Facility (NWEF).* The NWEF at Albequerque, New Mexico, performs T&E and provides technical support for weapons systems.

MARINE CORPS

- *Marine Corps Development and Education Command (MCDEC).* The MCDEC at Quantico, Virginia, *inter alia,* performs RDT&E for Marine Corps doctrine and equipment.

AIR FORCE

- *Air Force Flight Test Center (AFFTC).* Located at Edwards AFB, California, AFFTC conducts development test and evaluation of manned and unmanned aerospace vehicles at Edwards AFB. Operates the Utah Test and Training Range (UTTR).
- *Armament Division (AD).* AD, at Eglin AFB, Florida, conducts development testing of electronic warfare systems and nonnuclear munitions.
- *Arnold Engineering Development Center (AEDC).* AEDC performs flight test simulation for air-breathing and rocket engines and space and reentry vehicle test and simulation at Arnold AFS, Tennessee.
- *Western Space and Missile Center (WSMC).* WSMC manages and operates the Western Test Range providing launch operations and con-

tinuous trajectory coverage of a broad portion of the Western U.S. and the Pacific Ocean.

- *Eastern Space and Missile Center (ESMC).* Headquartered at Patrick AFB, Florida, ESMC conducts Air Force launch operations from Cape Canaveral AFS, Florida, and provides range support for Air Force, Navy and NASA launch operations in the Atlantic Ocean area.
- *The 6585th Test Group.* Located at Holloman AFB, operates the High Speed Test Track, the Radar Target Scatter Facility (RATSCAT) and the Central Inertial Guidance and Test Facility (CIGTIF).
- *The 4950th Test Wing.* Conducts avionics and systems testing in areas of navigation, communications, lasers, and radars. Operates the Aircraft Major Modifications Center (AFSC).

APPENDIX D
Instructions for the Preparation of Joint Integrated Logistics Support Plans (JILSP)

1. **How To Prepare and Use the JILSP:**

a. Preparation of the JILSP should be the responsibility of the executive service. Participating services should provide a central point of contact for coordination of the plan in their service.

b. The JILSP begins as a broad, objective-oriented document in the conceptual phase and becomes a more specific tasking and milestone scheduling document as a program progresses through the acquisition process. The JILSP should be tailored to the characteristics, needs, and complexity of each program and official program direction.

c. In preparing the JILSP, emphasize the specific tasks to be accomplished, who is responsible for the tasks, and the schedule for joint task. Brievity is essential; make all entries clear and concise. Keep narrative material to a minimum. Do not repeat information from other documents, unless it is needed to understand the JILSP. In tailoring the JILSP to the individual program, be innovative to accommodate unique program features consistent with comprehensive ILS planning.

d. Begin developing the JILSP during the concept ual phase of a program as part of the acquisition strategy. Guidance for preparation of the JILSP is included in paragraph 3.

e. Coordinate the JILSP with all participating and affected organizations. When signed by the PM, the JILSP becomes the ILS implementation plan that all participating activities must comply with.

f. Develop the JILSP so it can be used as a daily "working document" by working level personnel.

(1) Part I (General) and Part II (Concept/Strategy) contain all narrative portions of the plan. Narratives are not needed for any ILS function for which a milestone schedule chart is developed. While some general information may be necessary, those features and innovative techniques that are unique to the system must be identified. The narrative portion of the plan will be constructed so that changes are only required when basic objectives, concepts, or criteria are modified.

(2) Part III of the JILSP is made up of indi vidual milestone charts that can be easily updated to show program status and to identify the interfaces where a change to a specific task affects another task(s) within any milestone schedule chart. When a computer-supported, program management information system is used to reflect program status, consider using the computer system output products as Part III of the JILSP. Exercise caution to ensure that the outputs used are clear and complete enough, can be easily understood by reviewers and users of the JILSP without extensive study.

g. Services differences in ILS planning should be incorporated into the basic JILSP as an integral part of the planning process for the individual elements.

2. **JILSP Reviews.**

Review and update the JILSP whenever new program direction is received or changes occur that warrant realignment of logistics support planning. Keep a log of the last time each page was reviewed and updated.

3. **JILSP Format:**

a. Part I—General

(1) System Description—Briefly describe the system and equipment, its purpose, and general performance characteristics.

(2) Program Management—Identify all participating organizations and whether it is applicable to security assistance programs.

(3) Applicable Documents—Identify those documents that provide guidance or criteria necessary to accomplish functions described in the JILSP.

b. Part II—Concepts/Strategy:

(1) Operations Concept—Briefly describe the operational concept in terms of mission scenarios, operational environment, employment concepts, and deployment plans. Provide sufficient detail (annual operating days, annual number of missions, mean mission duration, etc.) to provide input to the LSA process.

(2) Maintenance Concept—Briefly describe maintenance requirements, considerations, and constraints in terms of number of skill level of maintenance personnel, number of inventory items,

maintenance environment, levels of maintenance, operational reliability and survivability requirements, failure diagnostic techniques, support equipment, and any maintenance considerations peculiar to the system. Identify any maintenance concept trade-offs to be performed. Provide sufficient detail (turnaround time, mean time between maintenance, mean time to repair, etc.) to support LSA data requirements. Include pertinent information about interservicing, interim contractor support, and contractor logistics support.

(3) Logistics Support Analysis—Describe the LSA program. Include a brief description of LSA tasks required, the structure of the LSA data system, and contractor—government interrelationships in the conduct of LSA.

(4) Acquisition Strategy—Briefly describe the procurement approach and define new or innovative contractual approaches for life cycle costs, logistics support costs, reliability improvement warranties (RIW), spares acquisition integrated with production concept, and interim contractor support. Also, describe budget and funding policies that are in addition to, or deviate from, standard procedures, etc.

(5) Test and Evaluation Concept—Briefly describe the test and evaluation concept in terms of DT&E, OT&E, participating organizations (including contractor), and management relationships. Include information on peculiar test requirements that are directly related to the ILS program (that is, reliability, maintainability, supportability, or contractual requirements related to a support cost guarantee or RIW). Address the interface between the LSA data system and the test program.

(6) Other Concepts—Briefly describe unique or innovative support concepts established or required to provide effective logistics support. Do not repeat standard support concepts, except to show the interface or rationale for the new concept. Briefly describe any peculiar aspects of the system, such as survivability considerations, technical data, support equipment, etc. Transportation and packaging concepts may be added, to describe unique requirements for protection and movement of system and equipment.

c. **Part III—Milestone Schedule Charts (MSC):**

(1) Use these charts to address specific ILS functions and to show the anticipated beginning and completion dates for each task and event, the assigned OPR, and the applicable resource requirements (as a minimum, identify OPRs by the three-letter office symbol).

(2) Use resource requirements to represent commitments agreed to by the participants.

(3) Coordinate the ILS milestones with all organizations involved, to ensure that tasks and events are complete, accurate, integrated with contractual requirements, and related to key "program" milestones.

(4) Do not include narrative in Part III of the JILSP.

(5) Set up the first MSC during the conceptual phase. During the full-scale engineering development (FSED), expand the MSC to include detailed tasks, responsibilities, and schedules for providing logistics support for the system or equipment.

(6) Delegate the responsibility for maintaining current status of the MSC to working level people in each ILS functional area. This includes tracking tasks and events, as well as reporting progress.

(7) Set up procedures to ensure that it becomes apparent that a milestone will not be met or when new program direction or guidance impacts the functional area.

(8) Set up and maintain management visibility of all hardware, down to and including all recoverable assemblies.

(9) MSCs should normally be prepared for each of the functional areas identified below, although MSCs for a specific program or project can be tailored by the ILSO, as approved by the PM. MSCs for the ILS elements should be developed using network analysis. Representative examples of the types of tasks and events that should be considered for tracking through MSCs are listed following each subparagraph heading. Individual MSCs must reflect the support to be provided by all participating services and agencies.

(a) Reliability and Maintainability (R&M) Interface—Set up R&M program plans; conduct R&M tradeoff studies; conduct R&M evaluation; define R&M design guidelines and requirements, failure mode and effects analysis (FMEA), and task and skill analysis; implement the LSA program; approve LSA plan; provide government inputs to the contractor; set up logistics design appraisal schedule; etc.

(b) Maintenance Planning—Attain required maintenance capability for organizational and intermediate repair; do the depot maintenance source of repair decision tree analysis and interservice screening; establish depot maintenance capability; identify requirements for interim contractor support; identify facilities and training requirements; ensure that provisions are made for survivability, corrosion prevention, spectrometric oil analysis, nondestructive inspection, structural integrity, built-in test equipment, built-in test and performance

monitoring, and maintenance activation planning, etc.

(c) Support Equipment—Identify, program, and deliver preoperational support equipment (SE); conduct SE guidance conference; set up requirements for SE, software, rights in data and computer resources, data, and documentation; review SE recommendations data (SERDS); identify, quantify, and program all operational SE; acquire and deliver SE on contract; identify, quantify, and program or acquire all logistics support elements needed to maintain the SE (spares, technical data, calibration requirements, etc.).

(d) Supply Support—Identify and program spares required for preoperational support; program disposition of residual preoperational assets; set up provisioning plans; identify requirement for interim contractor support; determine requirement for and conduct provisioning guidance conference; identify long leadtime items; identify, quantify, and program availability of spare and repair parts; etc.

(e) Packaging, Handling, and Transportation—Set up packaging, handling, and transportation concepts and criteria; identify packaging, handling, and transportation supply requirements; review transportability reports' review and evaluate data processed through the Container Design Retrieval System; develop transportation plan; review detailed packaging data; develop test support criteria; identify storage needs for hazardous materials, conventional munitions, etc.

(f) Technical Data—Prepare an engineering data management plan; define the engineering data required for specific organic functions; identify the tasks to be done during each program phase; set up plans and schedules for in-process reviews of engineering data; identify review team composition and responsibilities; conduct reviews; set up schedules for delivery of engineering data; prepare technical order publication plan; identify requirements for preliminary manuals, for operation and maintenance of all systems and equipments; prepare validation and verification plans; verify and validate technical orders; print and send out technical orders; etc.

(g) Facilities—Prepare facility requirements plan; conduct surveys to determine requirements for new or modified preoperational, operational, training, depot, or simulator facilities; budget for and construct facilities; etc.

(h) Manpower Requirements and Personnel—Insert a matrix of quantitive requirements for each function established for operation, supply, and maintenance of the equipment, the personnel skill code (MOS/AFSC/NEC) and the job title required. Include whether military, government, civilian, or contractor; describe the qualitative personnel skill requirements for operation and support; plan for operating/support commands to acquire personnel.

(i) Training and Training Support—Initiate government and contractor training; conduct follow-on crew and logistics support personnel training; identify, quantify, and program all required crew and maintenance training equipment, including simulators, as well as the logistics support elements required.

(j) Logistics Support Resource Funds—Prepare budget inputs for spares, common support equipment, preoperational support, stock fund, etc.

(k) Logistics Support Management Information—Take part in program reviews and logistics assessment reviews; conduct planning and guidance conferences; review and revise the JILSP; determine management data requirements, including test data feedback to LSA and provisioning activities; etc.

(l) Computer Resources Support—Deliver computer resources development plan; review computer program configuration item (CPCI) requirements; determine software needs, to meet system R&M requirements; deliver Part I specification; form a CRWG; publish the CRISP; etc. NOTE: This entry is deleted after publication of the CRISP and a cross-reference to the CRISP is entered herein.

(m) Energy Management—Conduct trade-off studies and analyses; develop energy conservation goals; perform modifications; etc.

(n) Survivability—Include logistics interface with nuclear hardness assurance planning and other special logistics considerations, to be included in logistics planning, to ensure design integrity of special survivability features throughout the system life cycle.

(o) Test and Evaluation—Set critical questions, issues, and DT&E and OT&E logistics objectives and requirements for the test and evaluation master plan; set logistics test requirements; identify representation for test planning work group. NOTE: This section addresses tasks and events for program level test planning documents. Detailed test tasks and events, required to support the planning and management of individual ILS functions, will be addressed under the sections for each function.

(p) Modification Planning—Document modification and kit proofing requirements; set up kit production rates compatible with proposed modification schedules; send modification proposal analysis; coordinate with the proper support activity and configuration control board representative; im-

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plement modification schedule; evaluate effectiveness of modifications, etc.

(q) Special Considerations—Set up requirements for contractor operations and support cost estimates and reporting; identify security assistance program requirements and site and depot activations; set up specific tradeoffs to be carried out by the contractor; set up requirements for the contractor to identify and submit the supply support plan, before the test; develop contractual requirements for support cost guarantee or RIW; develop a plan for assessing the accomplishment of hardware and support system goals; develop a verification and improvement program, site and depot activation, deficiency reporting (for example, specific routing and action channels for improvement or deficiency correction, material deficiency reporting), and other special considerations not included in one of the above categories.

APPENDIX E
Definition of Terms

Acquisition. The process for obtaining systems, equipment, or modifications to existing inventory items.

Acquisition Life Cycle. Normally, this consists of four phases, with each preceded by a milestone decision. Described below is a normal acquisition path, not a prescribed one that all programs must follow. A program may skip a phase or have program elements in any or all phases.

a. ***Program Initiation;*** Concept Exploration Phase (Phase 0). The identification and exploration of alternative solutions or solution concepts to satisfy a validated need, usually through the use of contracts with competent industry and educational institutions. This phase requires the active involvement of all participating commands to identify the candidate solutions and their characteristics. One or more of the selected candidate solutions is then approved for entry into the Demonstration and Validation Phase.

b. ***Requirement Validation;*** Demonstration and Validation Phase (Phase I). The period when selected candidate solutions are refined through extensive study and analyses; hardware development, if appropriate; tests; and evaluations. The objective is to validate one or more of the selected solutions and provide a basis for deciding whether to proceed into Full-Scale Development.

c. ***Program Go-Ahead;*** Full-Scale Development Phase (Phase II). The period when the system and the principal items necessary for its support are designed, fabricated, tested and evaluated. The intended output is, as a minimum: a preproduction system that closely approximates the final product; the documentation needed to enter the production phase; and the test results that show the product will meet the requirements. This phase includes the procurement of long lead production items and limited production for OT&E.

d. ***Production and Deployment;*** Production and Deployment Phase (Phase III).

(1) *Production Phase.* The period from production approval until the last system is delivered and accepted. The objective is to efficiently produce and deliver effective and supportable systems to the operating units. This includes the production of all principal and support equipment.

(2) *Deployment Phase.* The period encompassing the process of uniting facilities, hardware and software, personnel and procedural publications; and delivering an acceptable integrated system to the using and supporting commands. This overlaps the production phase.

Acquisition Logistics. The process of systematically identifying and assessing logistics alternatives; analyzing and resolving ILS deficiencies; and managing ILS throughut the acquisition process.

Acquisition Program. A directed effort funded either through procurement appropriations; through the Security Assistance Program; or through the Research, Development, Test and Evaluation appropriation with the goal of providing a new or improved capability in response to a validated need. An acquisition program may include either development or procurement of system, subsystems, equipment, munitions, or modifications to them, as well as supporting equipment, systems, projects, and studies. Excluded from this definition and from this regulation are the general purpose, commercially available automatic data processing assets defined under OMB Circular A-71 and DOD Directives 5105.55, 4160.19, and 5100.40.

Acquisition Risk. The chance that some element of an acquisition program produces an unintended result with adverse effect on system effectiveness, suitability, cost, or availability for deployment.

Availability. A measure of the degree to which an item is in an operable and commitable state at the start of a mission when the mission is called for at an unknown (random) time.

Built-In Test Equipment (BITE). Any device permanently mounted in the prime equipment, and used for the express purpose of testing the prime equipment, either independently or in association with external test equipment.

Combat System Test Installation. A collection of subsystems including weapons, sensor, and information processing equipment, together with their interfaces installed, for the purposes of early testing before the availability of a first production item, at a

fixed or mobile test facility designed to simulate the essential parts of the production item.

Contract. An agreement between two or more competent parties, in the proper form, on a legal subject matter, for a legal consideration.

Contract Definition. A funded effort, normally by two or more competing contractors, to establish specifications, to select technical approaches, to identify high-risk areas, and to make cost and production time estimates for developing large weapons systems.

Contract Work Breakdown Structure (CWBS). The complete WBS for a contract, developed and used by a contractor within the guidelines for MIL-STD 881A, and in accordance with the contract work statement.

Cost/Schedule Control Systems Criteria (C/SCSC). Criteria used to evaluate the effectiveness of contractors; internal systems. The C/SCSC do not require any data to be reported to the government, but do provide for access to data needed to evaluate the system and monitor its operation during the life of the contract.

Critical Issues. Those aspects of a system's capability, either operational, technical, or other, that must be questioned before a system's overall worth can be estimated, and that are of primary importance to the decision authority in reaching a decision to allow the system to advance into the next acquisition phase.

Decision Coordinating Paper/Integrated Program Summary (DCP/IPS). Used at Milestone II (and Milestone III if the SecDef's decision is required). Summarizes the DOD components acquisition planning for the system's life cycle and provides a management overview of the program.

Defense Acquisition Executive (DAE). The principal advisor and staff assistant to the Secretary of Defense and the focal point in OSD for System Acquisitions. The DAE is USDRE per DOD Directive 5000.1.

Defense System Acquisition Review Council (DSARC). An advisory body to the Secretary of Defense on major system acquisition. The Council members are the OSD staff principals plus service secretaries.

Depot Maintenance Interservicing. Use of a single service's depot maintenance capability, instead of each service developing an independent capability. This technique is part of the Standard Integrated Support Management System (SISMS).

Deputy Program Manager for Logistics (DPML). An experienced logistician who is assigned to a major program office to manage ILS.

Design to Cost. An acquisition management technique used to control a product's life-cycle cost. The technique embodies the establishment of "design-to-cost" goals for the new product early in the acquisition effort. The goals usually relate to segments of the product's life-cycle cost; for example, RDT&E, production, operation, and support. The technique applies only to acquisition or modification programs that involve design effort. Where a dollar figure cannot be fixed, suitable non-dollar parameters may be used (for example, mean time between failures, gallons per hour, numbers of personnel, etc.).

Designated Line Authority. Management personnel responsible for making major decisions during the acquisition of weapon systems. They typically include the SECDEF, Service Secretary or Competent Commander.

Development Test and Evaluation. That test and evaluation conducted to assist the engineering design and development process and verify attainment of technical performance specifications and objectives.

Development Test I (DT I). This test is conducted early in the development cycle, normally during the validation phase. Components, subsystems, or the entire system are examined to determine whether the system is ready for full-scale development. State-of-the-art technology is addressed to DT I (Army).

Development Test II (DT II). This test provides that technical data necessary to assess whether the system is ready for low-rate initial or full-scale production. It measures the technical performance and safety characteristics of the item and evaluates its associated tools; test equipment, training package, and maintenance test package as described in the development plan. DT II addresses accomplishments of engineer design goals (Army).

DOD Planning/Programming: Budgeting System (PPBS). An integrated system for the establishment, maintenance, and revision of the FYDP and the DOD budget.

Evaluation Criteria. Standards by which achievement of required operational effectiveness/suitability characteristics, or resolution of technical or operational issues may be judged. At Milestone II and beyond, evaluation criteria must include quantitative goals (the desired value) and thresholds (the value

beyond which the characteristic is unsatisfactory).

Five-Year Defense Program (FYDP). The Five-Year Defense Program summarizes all approved programs of the entire Department of Defense. Resources or inputs required for 5 years are combined with military outputs or programs for the same period. The FYDP is expressed in terms of programs, program elements, and resource categories: (a) mission operations; (b) administration; (c) supply operations; (d) maintenance or material; (e) property disposal; (f) medical operations; (g) base services; (h) maintenance of Real Property; (i) utility operations; (j) other engineering support; (k) minor construction; (l) personal support. Subfunctional categories are a finer grouping within the functional category grouping. They are used to accumulate expenses separately for various functions encompassed by a single functional category.

Government Furnished Equipment (GFE). Items in the possession of, or acquired by, the government and delivered to or otherwise made available to the contractor.

Handling. The coordination and integration of all operations embracing packaging, protection, and movement of material by available equipment for short distances.

Implementing Command. The command responsible for the acquisition and/or modification of the system (AF).

Initial Operational Test and Evaluation (IOT&E). That portion of Operational Test and Evaluation conducted prior to the Milestone III decision.

Integrated Logistics Support (ILS). A unified and interactive approach to the management and technical activities necessary to:

a. Cause support considerations to influence both requirements and design.

b. Define support requirements that are optimally related to the design and to each other.

c. Acquire the required support.

d. Provide for the required support in the operational phase at minimum cost.

Integrated Logistics Support Elements. Principal logistics elements that must be properly integrated to achieve economical and effective support of a system or equipment throughout its life cycle. (See DODI 5000.39).

Integratead Logistics Support Manager (ILSM). An experienced logistician who is assigned to manage ILS for programs not designated as major programs.

Integrated Logistics Support Office (ILSO). An ILS office within a program office.

Integrated Logistics Support Plan (ILSP). An Air Force management plan developed and used by the program manager and the DPML or ILSM, to manage the ILS process. This includes the horizontal integration of the ILS elements (that is, with each other), as well as their vertical integration into the various aspects of program planning, engineering, designing, testing, evaluating, and during production and operation. It also includes the integration of support elements with the mission elements of a system throughout its life cycle, and is updated as the program evolves.

Integrated Program Summary (IPS). Summarizes the DOD Component's acquisition planning for the system's life cycle and provides a management overview of the program.

Integrated Support Plan (ISP). An iterative document prepared by a contractor for the acceptance and approval of the acquisition activity. It describes the contractor's plan for managing the contractual ILS program, for complying with the specific contractual ILS requirements, and for planning any operational support functions assigned to the contractor.

Interim Contractor Support (ICS). A cost-effective logistics support alternative for a major system of a high cost or risk Class V modification. It allows the service to deter investment in all or part of the support resources (spares, technical data, support equipment, training equipment, etc.) and to use contractor support while the organic capability is being phased in.

Justification for Major System New Start (JMSNS). Major system new starts are considered in the OSD Program Objective Memorandum (POM) review on the basis of justifications provided by DOD Components. These justifications are prepared as a document called the JMSNS.

JT&E Program. An OSD program for JT&E, sponsored by the DDTE, structures to evaluate or provide information on system performance, technical concepts, system requirements or improvements, subsystems interoperability, improving or developing testing methodologies, or for force structure planning, doctrine or procedures.

Life-Cycle Cost (LCC). The total cost of an item or system over its full life. It includes the cost of acquisition, ownership (operation, maintenance, support, etc.), and disposal. To be meaningful, an expression of LCC must be placed in context with the cost ele-

ments included, period of time covered, assumptions and conditions applied, and whether it is intended as a relative comparison or an absoluste expression of cost effects.

Logistics Engineering. This function provides inputs to the systems engineering process in all acquisition phases. In general, these inputs are the support environment descriptors and constraints. This function uses the technical data developed by the systems engineering process to refine support plans, concepts, and requirements for a system's support in deployment and operational use. The logistics engineering function is a part of the mainstream engineering effort, to develop and achieve a suitable and cost-effective system. This function uses the detailed drawings that are prepared by design engineering to develop the specific requirements; that is, to develop such specific support items as tools, test equipment, personnel skills, and maintenance procedures.

Logistics Support Analysis (LSA). An analytical logistics effort within the systems engineering process to identify, define, analyze, quantify, and process logistics support requirements. The logistics support analysis record (LSAR) is the source of validated, integrated, and design-related data for an acquisition program. There are four functions of the LSA process:

a. To identify the qualitative and quantitative logistics considerations.

b. To influence the system and equipment design for logistics considerations.

c. To communicate requirements and provide an integrating influence.

d. To assess the achievement of logistics objectives. NOTE: LSA is described in MIL-STD-1388-1, and MIL-STD-1388-2.

Logistics Supportability. The degree to which the planned logistics (including test equipment, spares and repair parts, technical data, support facilities, and training) and manpower meet system availability and wartime usage requirements.

Long Lead Items. Those components of a system or piece of equipment that take the longest time to procure and, therefore, may require an early commitment of funds in order to meet acquisition schedules.

Maintainability. The ability of an item to be retained in or restored to specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair.

Major System Acquisition. A system acquisition program designated by the Secretary of Defense to be of such importance and priority as to require special management attention based on the criteria in the DOD Directive 5000.1

Memorandum of Agreement (MOA). An agreement between a program manager and a Contract Administration Office (CAO), establishing the scope of responsibility of the CAO with respect to the C/SCSC surveillance functions and objectives.

Memorandum of Understanding (MOU). An agreement between a contractor and a cognizant DOD Administratiave Contracting Officer, indicating the contractor's intention to use accepted management control systems on future contracts which require compliance with the C/SCSC.

Military Operational Requirements. The formal expression of a military need, response to which results in development or acquisition of items, equipment, or systems.

Mission Element. A segment of a mission area critical to the accomplishment of the mission-area objectives and corresponding to a recommendation for a major system capability as determined by a DOD Component.

Multiservice T&E. T&E conducted by two or more DOD Components for systems to be acquired by more than one DOD Component, or for a DOD Component's systems that have interfaces with equipment of another DOD Component.

Operating and Support Cost. Those resources required to operate, and support (O&S) a system, subsystem, or a major component during its useful life in the operational inventory.

Operational Effectiveness. The overall degree of mission accomplishment of a system used by representative personnel in the context of the organization, doctrine, tactics, threat (including countermeasures and nuclear threats) and environment in the planned operational employment of the system.

Operational Suitability. The degree to which a system can be satisfactorily placed in field use, with consideration being given to availability, compatibility, transportability, interoperability, reliability, wartime usage rate, maintainability, safety, human factors, manpower supportability, logistic supportability, and training requirements.

Operational Test and Evaluation (OTE). That test and evaluation conducted to estimate a system's op-

erational suitability, as well as the need for any modifications. It is accomplished by operational and support personnel of the types and qualifications expected to use and maintain the system when deployed and is conducted in as realistic an operational environment as possible.

Packaging. The process and procedures used to protect material. It includes cleaning, drying, preserving, packaging, marking, and utilization.

Pilot Production Item. An item produced from a limited production run to demonstrate the capability to mass produce the item for operational use.

Pre-Production Prototype. An article in final form employing standard parts, representative of articles to be produced subsequently in a production line.

Producibility. The relative ease of producing an item or system which is governed by the characteristics and features of a design that enable economical fabrication, assembly, inspection, and testing using available production technology.

Production Engineering. The application of design and analysis techniques to produce a specified product. Included are the functions of planning, specifying, and coordinating the application of required resources; performing analyses of producibility and production operations, processes, and systems; applying new manufacturing methods, tooling, and equipment; controlling the introduction of engineering changes; and employing cost-control techniques.

Production Feasibility. The likelihood that a system design concept can be produced using existing production technology while simultaneously meeting quality, production rate, and cost requirements.

Production Management. The effective use of resources to produce on schedule the required number of end items that meet specified quality, performance, and cost.

Production Readiness. The state or condition of preparedness of a system program to proceed into production. A system is ready for production when the completeness and producibility of the production design and the managerial and physical preparations necessary for initiating and sustaining a viable production effort have progressed to the point where a production commitment can be made without incurring unacceptable risks that thresholds of schedule, performance, cost, or other established criteria will be breached.

Production Readiness Review. A formal examination of a program to determine if the design is ready for production, production engineering problems have been resolved, and the producer has accomplished adequate planning for the production phase.

Program Decision Memorandum (PDM). The Secretary of Defense's approval of the Service's Program Objective Memorandum with tentative specific guidance.

Program Evaluation Review Technique (PERT). A technique for management of a program through to completion by constructing a network model of integrated activities and events and periodically evaluating the time/cost implications of progress.

Program Management Directive (PMD). The official HQ USAF management directive used to provide direction to the implementing and participating commands and satisfy documentation requirements. It will be used during the entire acquisition cycle to state requirements and request studies as well as initiate, approve, change, transition, modify or terminate programs. The content of the program management directive, including the required HQ USAF review and approval actions, is tailored to the needs of each individual program.

Program Manager (PM). The individual in the DOD chartered to manage a major system acquisition program.

Program Manager Charter. A document approved by the DOD Component Head stating the program manager's responsibility, authority and accountability in the management of a major system acquisition program.

Program Objectives Memorandum (POM). A memorandum in prescribed format submitted to the Secretary of Defense by the Secretary of a Military Department or the Director of a Defense Agency which recommends that total resource requirements within the parameters of the Secretary of Defense fiscal guidance.

Realistic Test Environment. The conditions under which the system is expected to be operated and maintained, including the natural weather and climatic conditions, terrain effects, battlefield disturbances, and enemy threat conditions.

Reliability. A fundamental characteristic of an item of material expressed as the probability that it will perform its intended function for a specified period of time under stated conditions.

Reliability, Mission. The ability of an item to perform its required functions for the duration of a specified mission profile.

Request for Proposal (RFP). Solicitation document used in negotiated procurement when the government reserves the right to award without further oral or written negotiation. Only the acceptance of the government is required to create a binding contract. Of course, the government can choose to negotiate further at its option.

Required Operational Characteristics. System parameters that are primary indicators of the system's capability to be employed to perform the required mission functions, and to be supported.

Required Technical Characteristics. System parameters that are primary indicators of the system's capability to be employed to perform the required mission functions, and to be supported.

Resident Integrated Logistics Support Activity (RILSA). An extension of the ILS office, colocated at the system or major equipment contractor's facility. The RILSA normally accomplishes the provisioning of spares and repair parts and carries out other logistics tasks, as assigned by the DPML.

(Service) System Acquisition Review Council ((S)SARC). A council established by the head of a military department as an advisory body to him and through him to the Secretary of Defense on major systems acquisitions. The (S)SARC is chaired by the Secretary/Under Secretary fo the military department and is similar in functional composition, responsibilities and operation to the DSARC. In application the term (Service) is replaced by the designation of the applicable Military Department, i.e., ASARC, NSARC and AFSARC.

Standard Integrated Support Management System (SIMS). A management approach, developed under the auspices of the joint logistics commanders (JLC), that provides a uniform way to plan and manage the logistics support of multiservice systems acquisitions.

Statement of Work (SOW). Although varying widely in precise definition, the term generally covers that portion of a contract which describes the actual work to be done by means of specifications or other minimum requirements, quantities, performance dates, and a statement of the requisite quality.

Survivability. The degree to which a system is able to avoid or withstand a hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

System Acquisition Process. The sequence of acquisition activities starting from the agency's reconciliation of its mission needs, with its capabilities, priorities and resources, and extending through the introduction of a system into operational use of the otherwise successful achievement of program objectives.

Systems Concept Paper (SCP). The SCP provides basic documentation for use by DSARC members in arriving at a recommendation to the Secretary of Defense at Milestone I.

System Program Office (SPO). The organization comprised of technical and business management and administrative personnel assigned full time to a system program director. The office may be augmented with additional personnel from participating organizations.

Test and Evaluation Master Plan. An overall test and evaluation plan, prepared as early as possible in the acquisition process, and designed to identify and integrate objectives, responsibilities, resources, and schedules for all test and evaluation to be accomplished prior to the subsequent key decision points.

Transportability. The inherent capability of material to be moved by towing, self-propulsion, or by railways, highways, waterways, pipeline, oceans and airways, utilizing existing equipment or equipment that is planned for the movement of the item being considered.

Vulnerability. For weapon system acquisition decisions, three considerations are critical in assessing system vulnerability: susceptibility—a system limitation or weakness (may not be exploitable); accessibility—the openness of a system to exploitation by a countermeasures technique; and feasibility—the practicality and probability of an adversary exploiting a susceptibility in combat.

Work Breakdown Structure (WBS). A product-oriented family tree division of hardware, software, services, and other work tasks that organizes, defines, and graphically displays the product to be produced, as well as the work to be accomplished to achieve the specified product.

APPENDIX F
List of Joint Service Programs

PROGRAM/PROJECT TITLE	*PROGRAM OFFICE LOCATION*	*LEAD SERVICE(S)*	*PARTICIPATING SERVICE(S)*	*CLASSIFICATION TYPE (SEE FIGURE 1-1)*
LIFE SUPPORT SYSTEMS	ASD/AES Wright-Patterson AFB, OH	Air Force/Army Navy	Air Force/Army/Navy	M-1
MOBILE AIRCRAFT ARRESTING SYSTEM	NAEC Lakehurst, NJ	Navy	Air Force	S-2
CHEMICAL/BIOLOGICAL DEFENSE EQUIPMENT	ASD/AESD Wright-Patterson AFB, OH	Army	Air Force/Navy	M-1
MOBILE TACTICAL SHELTERS	ESD/OCR Hanscom AFB, MA	Air Force/Army	Air Force/Army/ Navy/Marines	M-5
SUPPORT EQUIPMENT	ASD/AEG Wright-Patterson AFB, OH	Air Force/Army	Air Force/Army/Navy	M-5
AIR/GROUND/SEA LAUNCHED CRUISE MISSILE ALCM/GLCM/SLCM ENGINE & NAV GUIDANCE	JCMPO Alexandria, VA	Navy	Air Force	S-6
GROUND LAUNCHED CRUISE MISSILE	JCMPO Alexandria, VA	Navy	Air Force	M-4
MATE	ASD/AEGB Wright-Patterson AFB, OH	Air Force	Navy/Army	S-3
COMBAT ID SYS PROGRAM	ASD/XRQI Wright-Patterson AFB, OH	Air Force	Army/Navy	S-6
TIPI/MAGIS/MAGIC	ASD/DCR-I Hanscom AFB, MA	Air Force	Marines/Army	S-6

PROGRAM/PROJECT TITLE	*PROGRAM OFFICE LOCATION*	*LEAD SERVICE(S)*	*PARTICIPATING SERVICE(S)*	*CLASSIFICATION TYPE (SEE FIGURE 1-1)*
JOINT TACTICAL FUSION PROGRAM	JTFPMO/Harry Diamond Lab Adelphi, MD	Army	Air/Force/Navy/Marines	S-6
AIRBORNE SELF-PROTECTION JAMMER	NAVAIRSYSCOM Washington, DC	Navy	Air Force	S-6
AFSATCOM	SD/YKA Los Angeles AFS, CA	Air Force	Army/Navy	S-2
FLTSATCOM	SD/YKF Los Angeles AFS, CA	Navy	Air Force	M-4
DSCS	SD/YKD Los Angeles AFS, CA	OSD (DCA)	Air Force/Army/Navy	M-2
SPACE TRACK (ALTAIR MOD)	SD/YNC Los Angeles AFS, CA	Air Force	Army	M-4
DSP	SD/YG Los Angeles AFS, CA	Air Force	Air Force	S-2
IONDS	SD/YG Los Angeles AFS, CA	Air Force	Air Force	S-2
DMSP	SD/YD Los Angeles AFS, CA	Air Force	Navy/Army	S-2
SATELLITE DATA SYS	SD/YR Los Angeles AFS, CA	Air Force	Navy/Army	S-2
SATCOM	Ft. Monmouth, NJ	Army	Air Force/Marines/Navy	S-4
SPACE DEFENSE	SD/YN Los Angeles AFS, CA	Air Force	Air Force	S-1
NAVSTAR GPS	SD/YE Los Angeles AFS, CA	Air Force	Army/Navy/NATO/DOT DMA/Marines	S-6

PROGRAM/PROJECT TITLE	*PROGRAM OFFICE LOCATION*	*LEAD SERVICE(S)*	*PARTICIPATING SERVICE(S)*	*CLASSIFICATION TYPE (SEE FIGURE 1-1)*
SPACE SHUTTLE	SD/YV Los Angeles AFS, CA	Air Force	NASA, Navy	S-2
SPACE TEST PROGRAM	SD/YV Los Angeles AFS, CA	Air Force	Army/Navy	M-3
SPACE BOOSTERS/SPACE SUPPORT PROGRAM	SD/YV Los Angeles AFS, CA	Air Force	Navy	S-2
AIM-9L/M	NAVAIRSYSCOM/PMA-259B Washington, DC	Navy	Air Force	S-6
AIM-7F/M	NAVAIRSYSCOM/PMA-262-2 Washington, DC	Navy	Air Force	S-6
HARM	NAVAIRSYSCOM/PMA-242 Washington, DC	Navy	Air Force	S-6
MAVERICK (LASER) (IR)	ASD/TAM Wright-Patterson AFB, OH	Air Force	Navy/Marines	S-6
AMRAAM	AD/YM Eglin AFB, FL	Air Force	Navy	S-6
MULTIPLE STORES EJECTOR RACK (MSER)	Munitions SPO (SD-3) Eglin AFB, FL NAVAIRSYSCOM/AIR-541 Washington, DC	Air Force	Navy	S-6
FUEL AIR EXPLOSIVE (FAE II)	NAVAIRSYSCOM/AIR-541 Washington, DC Munition SPO (SD-3) Eglin AFB, FL	Navy	Air Force	S-6

PROGRAM/PROJECT TITLE	*PROGRAM OFFICE LOCATION*	*LEAD SERVICE(S)*	*PARTICIPATING SERVICE(S)*	*CLASSIFICATION TYPE (SEE FIGURE 1-1)*
AIR INFLATABLE RETARDER (AIR)	Munitions SPO (SD-3) Eglin AFB, FL NAVAIRSYSCOM/AIR 541 Washington, DC	Air Force	Navy	S-6
PMU-139/B BOMB FUZE	NAVAIRSYSCOM/AIR-541 Washington, DC Munitions SPO (SD-3) Eglin AFB, FL	Navy	Air Force	S-6
RANGE IMPROVEMENT/ ACMI	AD Eglin AFB, FL	Air Force	Navy	M-4
TRI-TAC	DOD TRI-TAC Office Ft. Monmouth, NJ	Air Force/Army	Navy/MC	M-2
DEB	ESD Hanscom AFB, MA	Air Force	Army/Navy	S-3
NEXRAD	ESD Hanscom AFB, MA	NOAA/NWS (DOC)	Air Force/NWS (DOC) FAA (DOT)	S-6
WSC	ESD Hanscom AFB, MA	NOAA (DOC)	Air Force/NOAA (DOC)	M-4
TRW	ESD Hanscom AFB, MA	Air Force	Army Navy	M-5 M-4
IWRS	ESD Hanscom AFB, MA	NOAA (DOC)	Air Force/NOAA (DOC)	S-5
BIGEYE WEAPON SYS	NAVAIRSYSCOM Washington, DC Munitions SPO Eglin AFB, FL	Navy	Air Force	S-3

PROGRAM/PROJECT TITLE	*PROGRAM OFFICE LOCATION*	*LEAD SERVICE(S)*	*PARTICIPATING SERVICE(S)*	*CLASSIFICATION TYPE (SEE FIGURE 1-1)*
GATOR	Munitions SPO (AD/SDS) Eglin AFB, FL ARRADCOM/OPOSA Dover, NJ NAVAIRSYSCOM Washington, DC	Air Force	Navy/Army	M-1
MRASM	JCMPO Washington, DC AD/SD-5 Eglin AFB, FL	Navy	Air Force	5-6 & M-2
	DCS/SYSTEMS JOINT SERVICE PROGRAMS			
E-3A	ESD Hanscom AFB, MA	Air Force	Navy	M-5
JTIDS	ESD Hanscom AFB, MA	Air Force	Navy/Army	S-6
SEEK TALK	ESD Hanscom AFB, MA	Air Force	Navy	S-2
HAVE QUICK	ESD Hanscom AFB, MA	Air Force	Navy	S-2
SINGARRS	ESD Hanscom AFB, MA	Army	Air Force/Navy	S-2
TACSI	ESD Hanscom AFB, MA	Air Force	Marine Corps	S-2

PROGRAM/PROJECT TITLE	*PROGRAM OFFICE LOCATION*	*LEAD SERVICE(S)*	*PARTICIPATING SERVICE(S)*	*CLASSIFICATION TYPE (SEE FIGURE 1-1)*
JINTACCS	ESD Hanscom AFB, MA	Army	Air Force/Navy	S-6
CONUS-OTH	ESD Hanscom AFB, MA	Air Force	Navy	S-4
COBRA JUDY	ESD Hanscom AFB, MA	Air Force	Army/Navy	M-1
R2508	ESD Hanscom AFB, MA	Air Force	Navy/FAA	M-1
SAFE PROGRAMS	ESD Hanscom AFB, MA	Air Force	Armt (Minimal)/ED	M-5
BISS PROGRAM	ESD Hanscom AFB, MA	Air Force	Army/NavyED	M-2
LIGHT ARMORED VEHICLE PROGRAM	TACOM Warren, MI	Army	Marine Corp	S-6

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